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Supplemental Ground Water Investigation Report I-70, 44th Street to Brighton Boulevard, City and County of Denver, Colorado

WALSH Project Number: 3026-010
CDOT Project No. IR-IM (CX) 070-4 (145)
September 15, 1999

Walsh
Environmental Scientists and Engineers, Inc.

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SUPPLEMENTAL GROUND WATER INVESTIGATION REPORT, I-70, 44TH STREET TO BRIGHTON BOULEVARD, CITY AND COUNTY OF DENVER, COLORADO

September 15, 1999

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EXECUTIVE SUMMARY

The findings of this investigation indicate that ground water containing PCE is entering the CDOT project area near I-70 and Brighton Boulevard from the southeast, and flowing under the project area toward the northwest. The plume of PCE contamination appears to extend from at least as far south as 44th Street and Brighton Boulevard, to at least as far northeast as the 4600 block of Brighton Boulevard, north of I-70 and Brighton Boulevard.

The concentrations of PCE were highest between TH-24 (530 µg/L and 480 µg/L in 1998 and 1999, respectively), and TH-26 (160 µg/L in 1999). PCE concentrations at TH-25 (23 µg/L in 1999) and at a number of locations near Brighton Boulevard and 44th Street suggest that concentrations may decrease to the northeast and southwest of the areas of highest observed PCE concentrations.

The findings of this investigation indicate ground water containing PCE at concentrations exceeding Colorado Ground Water Standards is entering the CDOT project area from upgradient sources, and that the PCE plume has extended under numerous properties. The full extent and origin of the PCE plume have not been delineated.

WALSH recommends that CDOT transmit the findings of this investigation to the Colorado Department of Public Health and Environment (CDPHE). CDPHE or perhaps the U.S. EPA may wish to conduct further investigations to determine the origin and extent of the PCE contaminated ground water in this area. The PCE contaminated ground water appears to originate from sources outside of CDOT's project area.

WALSH recommends that CDOT consider that any ground water which may be encountered during construction in the vicinity of I-70 and Brighton Boulevard may contain PCE in excess of Colorado Ground Water Standards. Any construction activities that involve handling of ground water will require prior testing of ground water for PCE, and proper handling and possibly treatment of PCE contaminated ground water.

The U.S. EPA is conducting an investigation of arsenic and lead in residential soils in this are of Denver. In this study, arsenic and lead concentrations were measured in surface soil at three non-residential locations. The highest observed arsenic concentration (38 mg/Kg at TH-26) was below target levels of the U.S. EPA investigation of residential soils in this area. The highest observed lead concentration (850 mg/Kg at TH-26) exceeded the target concentration of the U.S. EPA investigation of residential soils in this area. WALSH recommends that CDOT transmit the arsenic and lead data for these surface soils to CDPHE and the U.S. EPA.

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SUPPLEMENTAL GROUND WATER INVESTIGATION REPORT I-70, 44TH STREET TO BRIGHTON BOULEVARD, CITY AND COUNTY OF DENVER

INTRODUCTION

alsh Environmental Scientists and Engineers, Inc. (WALSH) has conducted a supplemental ound water investigation in the study area as requested by the Colorado Department of ansportation (CDOT). Tetrachloroethene (PCE) was discovered in ground water during ase II Site Investigation activities for CDOT Project No. IR-IM(CX)070-4(145). CDOT's nstruction project involves widening of I-70 from Washington Street to High Street in nver, Colorado. The PCE contamination was discovered during previous investigations on)OT's construction project (WALSH, 1991a, 1991b, 1992, 1996 and 1998).

e purpose of this 1999 investigation was to determine whether previously identified PCE ntamination in ground water originated within the area of CDOT's construction project, or m sources upgradient of CDOT's project area. Certain additional laboratory analyses were rformed on some soil and ground water samples collected during this investigation. Lead d arsenic were measured in surface soils at three locations at the request of the Colorado partment of Health and Environment. Volatile organic compounds (VOCs), including nzene, toluene, ethylbenzene and xylenes (BTEX), total extractable petroleum hydrocarbons EPH), and semivolatile organic compounds (SVOCs) were measure in soils from three test les to provide additional information on the distribution of various potential contaminants in s area.

)OT is in the process of converting to metric system. Therefore this document is in metric asurement format with American equivalents following in parenthesis, where appropriate. nere a manufacturers unit is given (e.g., 1,000 gallon tank), or a unit is common to)fessional literature, or is quoted from other sources, the original unit is retained.

e units milligrams per kilogram (mg/Kg) and milligrams per liter are used in place of parts · million (ppm) for solids and liquids, respectively, throughout this document. Similarly, crograms per kilogram (µg/Kg) and micrograms per liter (µg/L) are used in place of parts · billion (ppb). However, measurements of headspace gases are reported in ppm.

. figures referenced in the body of this document are presented in Appendix A. Tables are sented in Appendix B, soil boring/monitoring well construction details in Appendix C, field a transmittal sheets in Appendix D, and laboratory data in Appendix E.

PROPOSED CONSTRUCTION AND PROPERTY ACQUISITION

ıe CDOT is replacing the elevated portion of I-70 from Washington Street to Brighton ɔulevard with a wider, elevated highway (see Figure 2). Existing ramps at Humboldt Street ill be removed and replaced with interchanges constructed at Washington Street and Brighton ɔulevard. The existing elevated structure east of Humboldt Street will be replaced, and fill aterial will be used to support I-70 east of Humboldt Street.

esign plans indicate that property acquisition is required for the widening of I-70, the idening of Washington Street, and the relocations of 46th Avenue and Brighton Boulevard. ıe Union Pacific Railroad (UPRR) tracks (south of I-70 at Brighton Boulevard) will be ɔved southward to accommodate proposed ramp structures. Construction of retaining walls, issons, storm and sanitary sewers, and other utility relocations will require excavation at rious locations in the project area.

REGIONAL SETTING

1 Location

ıe area investigated is located within the City and County of Denver, Colorado and is shown Figure 1. The initial phase of the construction will involve the widening of the eastbound ıes of I-70 from Washington Street to Humboldt Street. Properties affected by the Phase I d Phase II construction activities were evaluated in WALSH, 1997and 1998. Properties ɔluded in this investigation are located between 44th Street and Brighton Boulevard, south of 70. The properties to be sampled have been or will be acquired by CDOT. Construction tivities will extend ramps away from I-70 and into existing neighborhoods and commercial ɛas approximately bounded by 44th Street and Brighton Boulevard on the south and 47th venue on the north. The UPRR tracks will be relocated south of their present position.

2 Physiography and Geology

ıe project area is located in the Denver Basin, east of the Front Range Uplift of the Southern ɔcky Mountains. Topographically the area is generally flat with elevations decreasing wards the South Platte River (Figure 1). Surface drainage is towards the South Platte River. ıe project area is covered by a thin veneer of unconsolidated sediments, including the oadway Alluvium (Quaternary) and the Post Piney Creek Alluvium (Holocene). These liments are generally poorly sorted sands, gravel, and some clays. Flat lying bedrock of the etaceous/Tertiary Denver Formation, consisting of weathered shale, siltstone, and fine ıdstone, is unconformably overlain by the younger unconsolidated sediments. Depth to the dulatory bedrock surface near I-70 and east of Humboldt Street is approximately 45 feet guirre, 1995).

'he top of the Denver Formation marks the base of the unconfined aquifer. Depth to ground vater is approximately 27 to 34 feet below ground surface in the vicinity of Humboldt Street nd Brighton Boulevard (WALSH, 1991b,1992 and Aguirre, 1995). Local, unconfined ground vater flow east of the South Platte River is to the northwest (WALSH, 1991b). Ground water low velocities were estimated to vary between 20 and 200 feet per year within the study area WALSH, 1996). More details of the local geology and ground water conditions are found in he various WALSH reports (1991b, 1992, 1996,1997, and 1998) and the geotechnical report y Aguirre (1995).

REVIEW OF EARLIER ENVIRONMENTAL INVESTIGATIONS

'hase II and III of the modifications to I-70 between Humboldt Street and Brighton Boulevard :averse a commercial, industrial and residential area where many environmental concerns ave been identified. Several properties of concern were identified between 44th Street and 3righton Boulevard in 1991 and 1992 (WALSH, 1991a, 1991b, and 1992), including nine roperties with known or suspected USTs. This study was expanded in July 1991 to include ie I-70 corridor from Washington Street to Brighton Boulevard and was revised in late 1996. 'hese reports identified four main categories of environmental concern: petroleum ontaminated soils and ground water from leaking USTs and ASTs; possible soil and ground vater contamination from tannery operations; and soil contaminated with smelter wastes esulting in elevated heavy metal content. Chlorinated solvents (PCE) were discovered in everal monitoring wells and sampling performed during March of 1999 has confirmed the resence of PCE at concentrations above safe drinking water levels. However no source has een positively identified for these contaminants. Abandoned USTs of unknown use were emoved from three locations during late 1998 and early 1999 (WALSH, 1999). Laboratory nalyses performed during the tank removals did not detect chlorinated solvents in either the ank contents or surrounding soils. Analyses detected only diesel range hydrocarbons which ndicated that the tanks had probably stored fuel oil.

'his investigation was intended to determine if PCE in ground water originated within 'DOT's project area, or migrated onto CDOT ROW from unknown up gradient sources. 'his work also provided confirmation of the presence of PCE within the project area, and dditional information on the extent of the PCE contamination.

SITE ASSESSMENT ACTIVITIES

VALSH drilled three additional test holes/monitor wells (TH-26, TH-27, and TH-28) on June 7 and June 18, 1999 in the southeast (up gradient) area of the project to identify possible ffsite migration onto the property from the southeast. The location of ground water test holes 'H-26, TH-27, TH-28 are shown on Figure 2.

VALSH sampled the three newly installed test holes, and re-sampled four previously existing est holes TH-19, TH-25, TH-24, and TH-7 (W) on March 23, 1999, to help determine the own gradient extent of contamination and possible impacts to offsite receptors.

)und water was analyzed for volatile organic compounds (VOCs) and total extractable :oleum hydrocarbons (TEPH). Soil samples from drilling activities were also analyzed for Cs and TEPH in addition to total lead and arsenic and semi-volatile organic compounds 'OCs) from drill cuttings of surface soils.

tic water levels were surveyed in the wells to refine potentiometric surface maps and help ermine ground water flow directions and pathways.

part of an ongoing Corrective Action Plan and Final Site Characterization for a former lerground storage tank (UST) at Parcel 49, WALSH sampled ground water at temporary zometer locations PZ-1, PZ-2 and PZ-3 (See Figure 2) on June 25, 1999. Ground water ıples at PZ-1, PZ-2 and PZ-3 were also analyzed for PCE contamination. The sampling analysis of ground water at PZ-1, PZ-2 and PZ-3 are presented in Corrective Action Plan Final Site Characterization Report Parcel 49, Tank 2, I-70 and Brighton Boulevard, ıver, Colorado (WALSH, 1999).

SAMPLING METHODOLOGIES

Soil Sampling

e locations of the test holes are shown on Figure 2. Test holes were drilled to a depth of)roximately 9.1 meters (30 feet) below ground surface (bgs). Test holes were drilled using ıch hollow stem continuous fight augers. Test holes were monitored during drilling for h combustible gases and VOCs using a calibrated combustible gas indicator (CGI) and a ibrated photoionization detector (PID). Sample headspace measurements were taken using PID to field screen for VOCs.

l samples from all test holes were collected from drill cuttings from the ground surface erval to approximately 0 to 0.9 meters (0-3 feet) bgs and thereafter, at 5-feet intervals using tainless-steel split spoon sampler. The soil sample from the 0 to 0.9 meter (0-3 feet), and) additional soil samples collected from the most suspect interval and soil/ground water erface zone were sent to the laboratory. All samples were collected in glass jars with lon-lined lids. Samples were kept in coolers for delivery to the laboratory. Chain-of-tody records were completed for each sample. Complete logs were prepared for all test es.

Ground Water Sampling

ound water was sampled through factory-slotted (screened) PVC pipe inserted in the test es. Screened PVC sections were installed from total depth to at least 2 feet above the static ter table. Solid 2-inch PVC sections with a locking cap was used to extend the screened erval to the surface. Silica sand was poured around the PVC to approximately 2 feet above

e screen, and bentonite chips were added from the sand level to approximately 1.5 feet low the surface to seal the annular space. Concrete was used to secure a flush mount. Test les (TH-26, TH-27, TH-28) were developed by purging a minimum of 10 casing volumes of ıter. Remaining test holes to be sampled were purged of three casing volumes. Prior to mple collection, the well headspace was measured for VOCs using a PID and the standing ıter was field tested during bailing for pH, conductivity and temperature. The stability of ese measurements and the total volume of water purged assured that the ground water mple is representative of the formation. Ground water sampling forms were completed for ch test hole.

ound water samples were retrieved with a disposable polypropylene bailer and collected for alysis as follows: two 40-milliliter (ml) VOA vials for VOCs; and one 1-liter (L) glass ttles for TEPH. All samples were placed immediately in an ice-filled cooler and delivered the laboratory with complete chain-of-custody records.

3 Surveying

e potentiometric surface of this area is known from previous studies (WALSH 1991b, 98). The ground level and casing elevations of newly installed test holes was recorded by bal positioning system (GPS) by Drexell Barrell, Inc. of Colorado Springs, using the dual quency method, as specified in the contract with CDOT.

LABORATORY ANALYSES

il and ground water samples collected for semi-volatile organic compounds (SVOCs, EPA ethod 8270), volatile organic compounds (VOCs, EPA Method 8260), and total extractable troleum hydrocarbons (TEPH, diesel range hydrocarbons, EPA Modified Method 8100), re analyzed at the WALSH Laboratory in Boulder, Colorado. Soil samples collected for al lead and arsenic (EPA Methods SW 7421 and 7060) were analyzed at Analytica boratories, Inc., in Broomfield, Colorado. Tables 3, 4, and 5 summarize the analytical ults for soil, and Table 6 summarizes the analytical results for ground water.

FIELD OBSERVATIONS

1 Test Hole Drilling

eld observations during drilling activities indicated similar lithology for the three test holes. om 0 to 0.9 meters (0-3 feet), black, fill material (coal dust) consisting of silty clay was countered. Lithology from 1.5 meters (5 feet) to 6.1 meters (20 feet) consisted of coarse to e sand with layers of silty sand and intermittent layers of clayey silt and sand present. The il/ground water interface zone at roughly 7.6 meters (25 feet) and phreatic zone at 9.1 ters (30 feet), consisted predominantly of coarse to fine sand and medium to fine gravel

Staining and odors were not observed throughout the profile of each test hole, however, PID readings were registered. PID readings from TH-26 ranged from 0 to 7 ppm. PID readings from TH-27 ranged from 0.1 ppm to 23.6 ppm. PID readings from TH-28 ranged from 0 ppm to 1.6 ppm.

The soil ground water interface zone was encountered during drilling activities at roughly the 7.6 to 8.2 meters (25-27 feet) bgs interval. At 9.1 to 9.8 meters (30-32 feet) bgs, the soil was completely saturated.

8.2 Ground Water Sampling

Ground water samples were collected from pre-existing test holes TH-7 (W), TH-19, TH-24, and TH-25 on March 23, 1999. Test holes TH-26, TH-27, and TH-28 were developed and sampled on June 23, 1999.

Ground water in TH-26, TH-27, and TH-28 was silty (brown) in appearance at the onset of development, and remained silty at the time of sampling. Sheen, odors, discoloration were not observed in ground water.

10 ANALYTICAL RESULTS

10.1 Ground Water

10.1.1 VOCs , TVPH and TEPH

Concentrations of PCE in ground water exceeded Colorado Ground Water Standards at all sample locations. Concentrations of PCE in ground water for down gradient test holes sampled on March 23, 1999 indicated the following concentrations: TH-7 (W), 61 µg/L; TH-19, 160 µg/L; TH-24, 480 µg/L; TH-25, 23 µg/L.

Concentrations of PCE in ground water for up gradient test holes sampled on June 23, 1999 indicated the following concentrations: TH-26, 300 µg/L; TH-27, 340 µg/L; TH-28, 160 µg/L (See Figure 3). All concentrations exceed the maximum contaminant level of 5 µg/L for PCE in ground water.

As reported separately (WASLH, 1999) PCE was found in ground water at PZ-1 (44 µg/L), PZ-2 (33 µg/L) and PZ-3 (7.8 µg/L). No ground water was collected at PZ-4.

TVPH and TEPH concentrations were non-detectable for all test holes, with the exception of a TEPH concentration in ground water at TH-7 (W) of 1,300 µg/L, and a TVPH concentration in ground water at TH-24 of 600 µg/L. Currently, there are no adopted state ground water standards for TVPH and TEPH.

0.2 Soil

0.2.1 VOCs and TEPH

.nalytical results for soil samples collected for analyses of VOCs (BTEX included) indicated on-detectable concentrations for all three newly installed test holes TH-26, TH-27, and TH-8. A TEPH concentration of 11 mg/Kg was detected in TH-26 at 0 to 0.3 meters (0-1 feet) gs, and at 6 mg/Kg from 3 to 3.7 meters (10-12 feet) in soil at TH-28. These concentrations f TEPH, however, are in compliance with Department of Labor and Employment, Oil ıspection Section (DOLE-OIS) Tier 1Risk Based Screening Levels (RBSLs) of 500 mg/Kg)OLE-OIS, 1999). Table 3 in Appendix B summarizes analytical results for VOCs and EPH.

0.2.2 SVOCs

.nalytical results for shallow soil samples collected for analyses of SVOCs indicated non-etectable concentrations for TH-26 and TH-27. Detectable levels of phenathrene (0.34 ıg/Kg), fluoranthene (0.56 mg/Kg), pyrene (0.92 mg/Kg), chrysene (0.37 mg/Kg), and enzo(b)fluoranthene (0.43 mg/Kg) were indicated in soil form 0.3 to 0.9 meters (1-3 feet) bgs)r TH-28. These concentrations, however, are below residential and industrial surficial soil 'ier 1 RBSLs. Table 4 in Appendix B summarizes analytical results for SVOCs.

0.2.3 Total Arsenic and Lead

.nalytical results for shallow soil samples collected for analyses of total arsenic and lead ıdicated detectable levels in TH-26, TH-27, and TH-28. The soil sample from 0 to 0.3 ıeters (0-1 feet) bgs at TH-26 contained a total arsenic concentration of 38 mg/Kg, and total :ad of 850 mg/Kg. The soil sample from 0 to 0.3 meters (0-1 feet) bgs at TH-27 contained a)tal arsenic concentration of 4.7 mg/K, and total lead of 68 mg/Kg. The soil sample from .3 to 0.9 meters (1-3 feet) bgs contained a total arsenic concentration of 15 mg/Kg, and total :ad of 140 mg/Kg. These detectable levels are consistent with background metal oncentrations typically associated with soils in the western U.S range, with the exception of ıe total lead concentration for TH-26, which exceeds the range of 2-300 mg/Kg (Bowen, 979). Table 5 in Appendix B summarizes analytical results for total arsenic and total lead.

1 CONCLUSIONS AND RECOMMENDATIONS

'he findings of this investigation indicate that ground water containing PCE is entering the :DOT project area near I-70 and Brighton Boulevard from the southeast, and flowing under ıe project area toward the northwest. The plume of PCE contamination appears to extend

rom at least as far south as 44th Street and Brighton Boulevard, to at least as far northeast as he 4600 block of Brighton Boulevard, north of I-70 and Brighton Boulevard.

Ground water was again determined to flow to the northwest, confirming earlier findings. The oncentrations of PCE were highest between TH-24 (530 µg/L and 480 µg/L in 1998 and 999, respectively), and TH-26 (160 µg/L in 1999). PCE concentrations at TH-25 (23 µg/L n 1999) and at a number of locations near Brighton Boulevard and 44th Street suggest that oncentrations may decrease to the northeast and southwest of the areas of highest observed 'CE concentrations.

The findings of this investigation indicate ground water containing PCE at concentrations xceeding Colorado Ground Water Standards is entering the CDOT project area from pgradient sources, and that the PCE plume has extended under numerous properties. The full xtent and origin of the PCE plume have not been delineated.

VALSH recommends that CDOT transmit the findings of this investigation to the Colorado)epartment of Public Health and Environment (CDPHE). CDPHE or perhaps the U.S. EPA ıay wish to conduct further investigations to determine the origin and extent of the PCE ontaminated ground water in this area. The PCE contaminated ground water appears to riginate from sources outside of CDOT's project area.

VALSH recommends that CDOT consider that any ground water which may be encountered uring construction in the vicinity of I-70 and Brighton Boulevard may contain PCE in excess f Colorado Ground Water Standards. Any construction activities that involve handling of round water will require prior testing of ground water for PCE, and proper handling and ossibly treatment of PCE contaminated ground water.

Io significant contamination by VOCs (including PCE) was detected in soil samples from 0.3) 3.7 meters below ground surface at TH-26, TH-27 and TH-28. There was also no ignificant BTEX, TEPH or SVOC contamination in these soils.

rsenic and lead concentrations were measured in surface soil (0 to 0.3 meters) at TH-26, H-27 and TH-28. These surface soil sample locations are not at residential properties. The ighest observed arsenic concentration (38 mg/Kg at TH-26) was below target levels of the .S. EPA investigation of residential soils in this area. The highest observed lead oncentration (850 mg/Kg at TH-26) exceeded the target concentration of the U.S. EPA ıvestigation of residential soils in this area. WALSH recommends that CDOT transmit the rsenic and lead data for these surface soils to CDPHE and the U.S. EPA.

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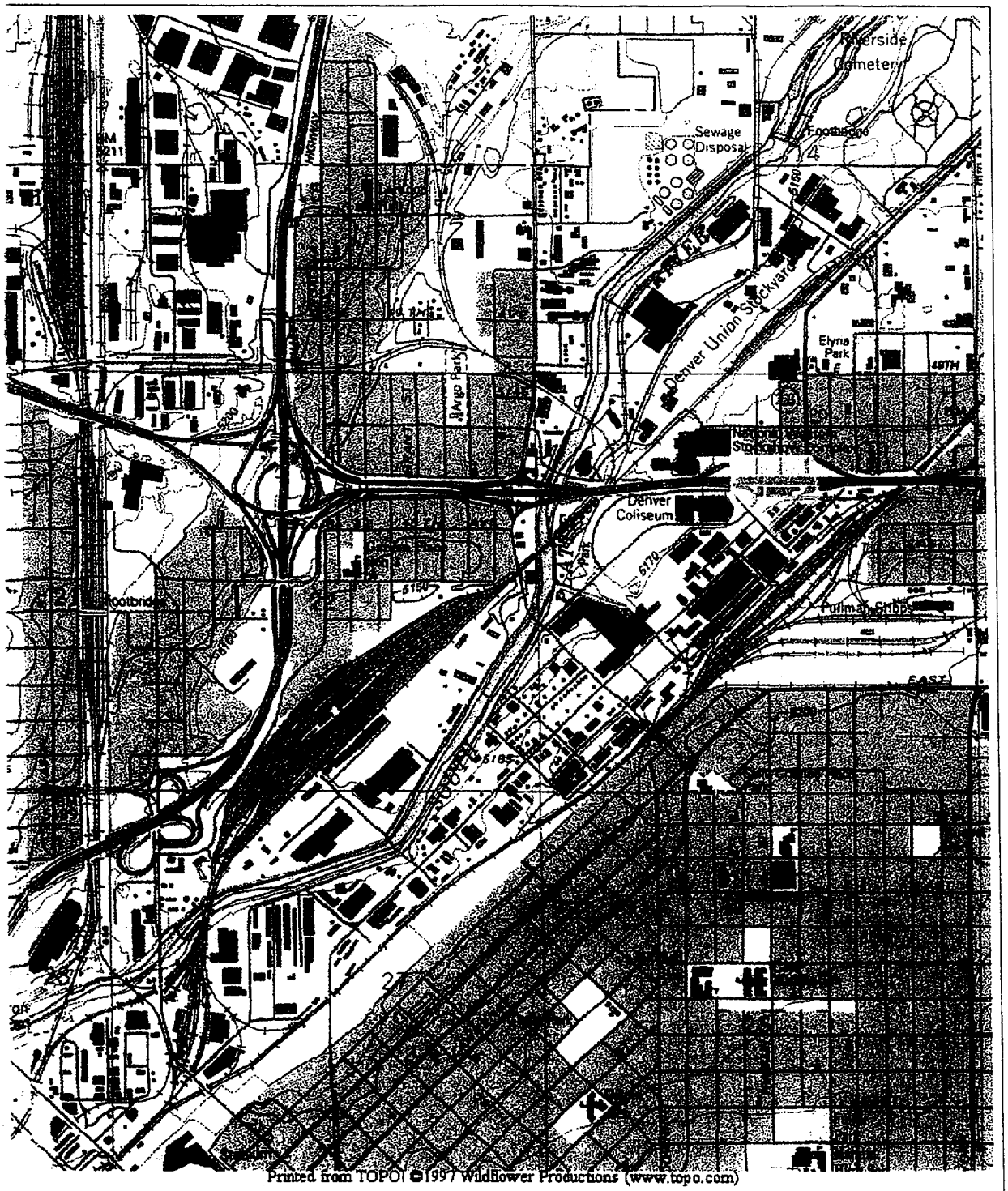
APPENDIX A

FIGURES



R 68 W

Approximate Map Scale: 1: 15,000

Map Source: USGS Commerce Quadrangle
Colorado, 7.5 Min. Series (topographic) 1959
Revised 1980

Site

N

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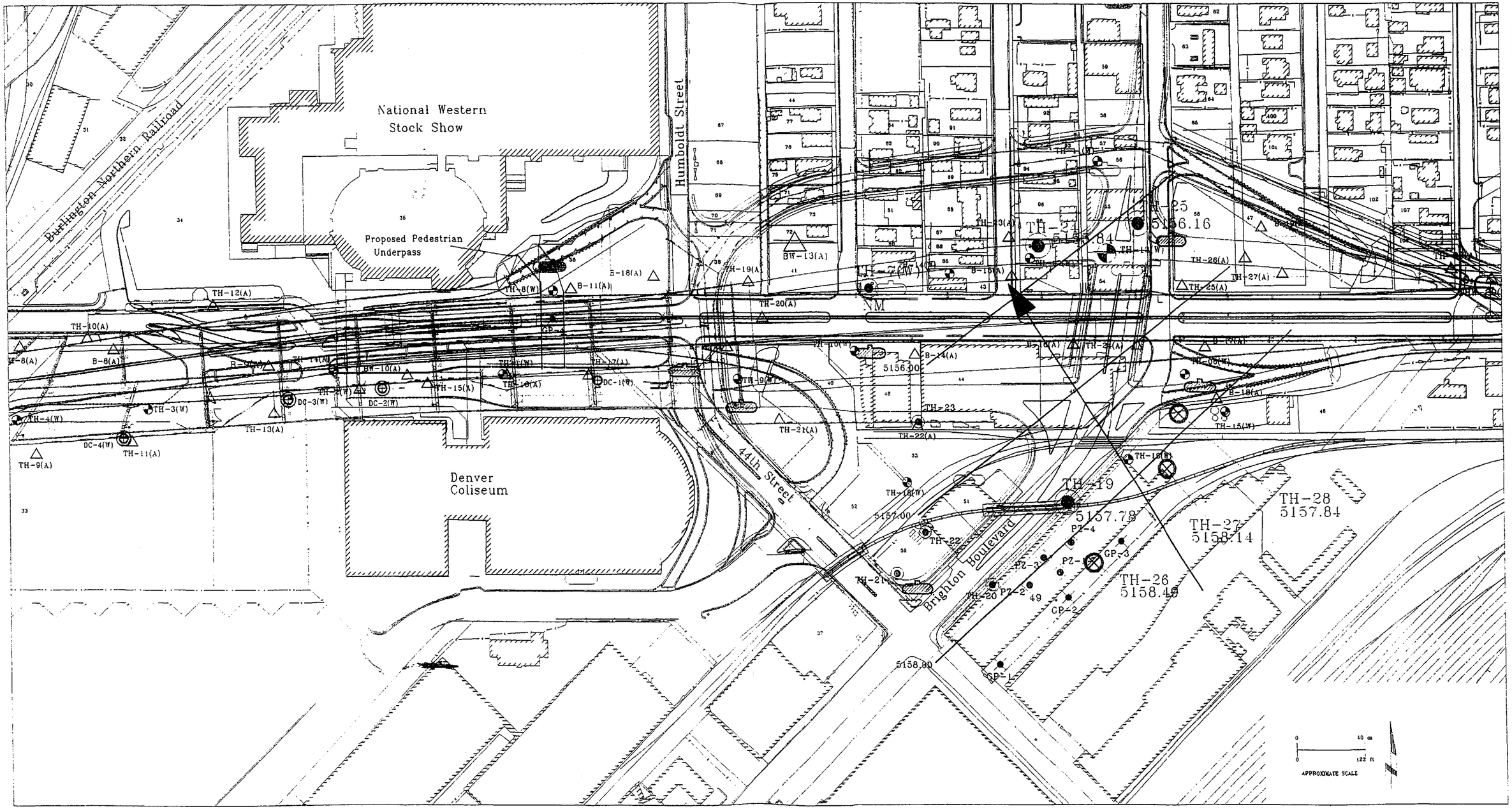
Site Vicinity Topographical Map

Job 3026-010	Date 9/99	Figure 1

26t010b.CDR 6/99 AFG, mod. rtm 9/99



Explanation

- Washington Street Shallow Soil Boring (Walsh, 1997)
- Denver Coliseum Area Test Holes (Walsh, 1997)
- Denver Coliseum Area Test Holes (Walsh, 1997) Completed as Monitor Wells
- Walsh Monitor Well (1991)
- Aguirre Geotechnical Hole (1994,1995)
- Walsh Geoprobe Soil Sample Site, 1998
- 33 Approximate Property Boundary and ID Number
- Former Aboveground Storage Tank(s)
- Walsh Test Hole, 1999 Potentiometric Surface Measured on 6/25/99
- Former Barrel Storage
- Former Underground Storage Tank(s)
- Underground Storage Tank(s) - Removal Unknown
- Underground Storage Tank(s)
- Walsh Temporary Peizometer, 1999 Sampling Location
- Potentiometric Surface Contour Contour Interval = 1.0 foot
- Proposed Monitoring Well
- Walsh Test Hole, 1998, 1999 Resample Location, Potentiometric Surface Measured on 3/23/99
- Aguirre Geotechnical Hole (1994, 1995) Sampling Location
- Ground Water Flow Direction
- Proposed sidewalks and riprap
- Proposed curbs and gutters
- Proposed retaining walls
- Proposed storm and/or sanitary sewers
- Proposed gas
- Proposed telephone
- Proposed water line

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Potentiometric Surface Map
Test Hole Locations

Job 3026-010 | Date 6/99 | Figure 4

3026m01d.dwg 12/14/98 PB, mod. 3/23/99 rtm

APPENDIX B

TABLES

Table 1 - Ground Water Elevation Data

Monitoring Well	North Ground Level Elevation (Ft.)	North TOC[2] (Ft.)	Ground Water Level* (Ft. below TOC)	Potentiometric Surface Elevation (Ft.)
TH-7	NM	NM	27.80*	-
TH-19	5187.58	5187.27	29.49*	5157.78
TH-24	5185.21	5185.11	29.27*	5155.84
TH-25	5185.14	5184.98	28.82*	5156.16
TH-26	5186.62	5190.19	31.70**	5158.49
TH-27	5188.14	5191.74	33.60**	5158.14
TH-28	5186.10	5189.64	31.80**	5157.84

NM No Measurement
TOC Top of Casing
* Ground water levels measured on 03/23/99
** Ground water levels measured on 06/25/99

Table 2 – PID Soil Screening Measurements

Monitoring Well	Date	Depth Meters (feet. bgs.)[1]	PID Reading (ppm)[2]
TH-26	06/16/99	0-0.15 (0-.5)	0.3
	06/16/99	1.5-2.1 (5-7)	2.4
	06/16/99	3-3.7 (10-12)	7.0
	06/16/99	4.6-5.2 (15-17)	0.0
	06/16/99	6.1-6.7 (20-22)	0.0
	06/17/99	7.6-8.2 (25-27)	0.0
	06/17/99	9.1 9.8 (30-32)	0.0
TH-27	06/18/99	0-0.3 (0-1)	12.8
		1.5-2.1 (5-7)	23.6
		3-3.7 (10-12)	6.9
		4.6-5.2 (15-17)	5.5
		6.1-6.7 (20-22)	1.5
		7.6-8.2 (25-27)	0.9
		9.1-9.8 (30-32)	0.1
TH-28	06/17/99	0-0.3 (0-1)	0.0
		0.3-0.9 (1-3)	1.4
		1.5-2.1 (5-7)	1.6
		3-3.7 (10-12)	3.9
		4.6-5.2 (15-17)	0.6
		6.1-6.7 (20-22)	0.0
		7.6-7.8 (25-27)	0.0
		9.1-9.8 (30-32)	0.0

Table 3 – VOCs and TEPH Soil Analytical Results (mg/Kg)

Monitoring Well	Date	VOCs	VOCs	TEPH	TEPH
TH-26	6/16 & 6/17/99	ND @ 0.3-0.9 (1-3) ##	ND @ 7.6-8.2 (25-27)	11 @ 0-0.3 (0-1)	ND @ 7.6-8.2 (25-27)
TH-27	6/18/99	ND @ 1.5-2.1 (5-7)	ND @ 7.6-8.2) (25-27)	ND @ 1.5-2.1 (5-7)	ND @ 7.6 8.2 (25-27)
TH-28	6/17/99	ND @ 3.0-3.7 (10-12)	ND @ 7.6-8.2 (25-27)	6 @ 3.0-3.7 (10-12)	ND @7.6-8.2 (25-27)

- VOCs include BTEX analyses
Depth in Meters bgs (feet bgs)

Table 4 – Semi-Volatile Organic Compounds (SVOCs) Soil Analytical Results (mg/Kg)

Monitoring Well	Date	Phenathrene	Fluoranthene	Pyrene	Chrysene	Benzo(b)-Fluoranthene
TH—26 @ 0-0.3 (0-1) ##	6/16 & 6/17/99	<0.33	<0.33	<0.33	<0.33	<0.33
TH-27 @ 0-0.3 (0-1)	6/18/99	<0.33	<0.33	<0.33	<0.33	<0.33
TH-28 @ 0.3-0.9 (1-3)	6/17/99	0.34	0.56	0.92	0.37	0.43

= Depth in meters (feet bgs)

Table 5 – Total Arsenic and Lead Soil Analytical Results (mg/Kg)

Monitoring Well	Date	Total Arsenic	Total Lead
TH—26 @ 0-0.3 (0-1) ##	6/16/99	38	850
TH-27 @ 0-0.3 (0-1)	6/18/99	4.7	68
TH-28 @ 0.3-0.9 (1-3)	6/17/99	15	140
Western U.S. Range*	1979	0.1-40	2-300

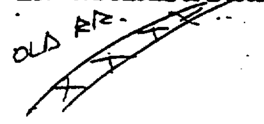
Concentrations in BOLD exceed Western U.S. Range background concentrations
* Bowen 1979

sh Environmental, Inc.

ING LOG

Boring Number	Sheet
TH-27	1 of 1

Location Sketch or Description. TH-27



STAKE 04124

4N

Location ~62' NORTH Stake # 4124

Drilling Contractor SITE SVCS GEOFF / TONY

od and Equipment CMS 55

nd Date

Start 6/18/99 Finish 6/18/99

Logger V.A Secondo

Sample: Interval	Sample: Tag No.	Sample: Recovery	Standard Penetration Test Results 6"-6"-6" (N)	Soil Description: USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content, Relative Density or Consistency, Soil Structure, Mineralogy.	Symbol of USCS Log	Comments: PID readings/stainings
			(0-1') @ 809	Grey-BLK Silty Clay, w/ Sand, F, No odors or stain	CL	PID = 12.8 (SVOCs / metals)
X			@ 0818 3-4-4-4 24/24"	Similar a.a. to 5'3". Into Sand & Silt, F, grading to Sand, F grey/orange @ 6.5'. Loose, damp. No odors/stains	SM / SP	PID = 23.6 (VOCs TPH) → (CL) in shoe (grey)
X			@ 0824 7-18-20-21 24/24"	Lt br. Sand c-m, some F, gravel, subrded, F, loose, damp. No odors or stains	SP	PID = 6.9
X			@ 0832 12-28-31-37 24/24"	Br Silt/Sand, Fine w/ F gravel to 15'6". Into c-vc sand, to m-F sand w/ cobbles & F gravel, loose, dry.	SM / SP	PID = 5.5
X			@ 0844 2-18-21-50 @ 5" 16/24"	a.a. (15.6 - 17')	SP	PID = 1.5
			@ 0854 10-20-22-21 /24"	Lt br-wh Sand, m-F, fine gravel, & cobbles Coarsening towards 27'. Damp to MOIST (Fringe). NO odors / stains	SP	PID = 0.9; ▽ ~25-27' (Fringe) (VOCs TPH)
			@ 0906 4-16-29-39 /24"	Gravel, m-F, sbrd, & VC sand. Some m-F, saturated to ~31'. Predominantly c-m Sand, br, some F, + F gravel to 32'. Saturated. EOB = 30' Set Well	GW	PID = (.1)

193

lsh Environmental, Inc.

RING LOG

ıber	Boring Number	Sheet
0	TH-28	1 of ___

Location Sketch or Description.

Location ___

Drilling Contractor Site SCS.

ıthod and Equipment ___

and Date ___ Start 6/17/99 @1145 Finish ___ Logger WB

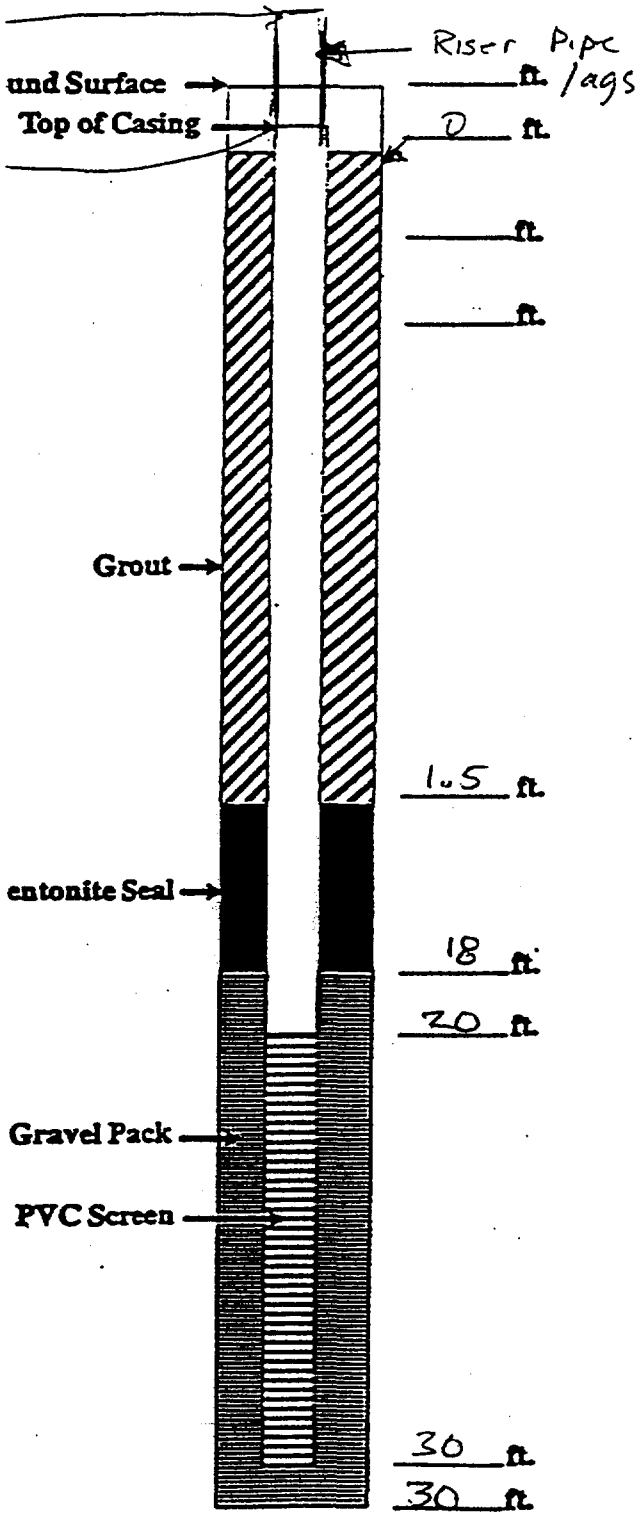
Sample Interval	Sample Tag No.	Sample Recovery	Standard Penetration Test Results 6" - 6" - 6" (N)	Soil Description: USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content, Relative Density or Consistency, Soil Structure, Mineralogy.	Symbol of USCS Log	Comments: PID readings/stainings
				0-1' - Blk SM, Silt/sand, Little clay, coal dust	SM/CL	PID = 0.0
				1-3' a.a. but wet		PID = 1.4 (Pb, As @ VOC)
			@1153	3-5 a.a. but Br, no coaldust		
X			2-2-2-3 24/24	as 0-1 to 5'3"; into SM silty Sand, with Clay to ~5'7"; ↓ clay, & wetter to 7' with ↑ Fine gravel. Damp.	SM-ML	PID = 1.6
X			@1204 5-6-7-8 24/24	Sand, m-F, with F gravel, br, loose, dry to 10'6"; into SM silty Sand, br, slt plastic, damp w/ ↑ clay towards 12'. No odors / stains	SP/SM	PID = 3.9 (VOCs) (TEH)
X			@1215 8-8-8-20 24/24	Lt. br-tan Sand, F, & Silt, m-F gravel, dry, loose to 16'	SP/SM	PID = .6
				16' - 17 M-F gravel to m-F Sand, loose, white-br, dry. No odors / stains. (~2' of F stain)	GW	
X			@1223 4-9-12-17 23/24	Lt br Sand, m-F + Fine gravel, loose, dry to 21'4"; Thin sandy with ↑ m-F gravel & cobbles. 1" of clay @ ~22'; No stains or odors.	SP/GW	PID =
X			@1236 6-12-15-21 19/24"	Sand, Lt br-white, m-F, some c sand, m-F gravel & cobbles. Loose. Moist. No odor / stains	SP	∇ ~25' (VOC TEH)
X			@1245 24/24 12-15-16-14	A.A. but saturated. Set well @ 30'		

3/10/95

Falsh & Associates, Inc.
tal Scientists and Engineers

WELL CONSTRUCTION LOG

.3026-010 Well No. TH-26



Measuring point is top of CASING unless otherwise noted

Drilling Summary

Total Depth of Hole: 30'
Hole Diameter: 7" OD
Drilling Company: Site Svcs
Driller: Tony / Ixcoff
Rig Type: CME-55
Bits: 7" HSA, 2' long SS sampler.
Geologist: VA Seconaro

Construction Time Log

	Start Date	Start Time	Finish Date	Finish Time
Drilling:				
Screen Placement:				
Filter Placement:				
Seal Placement:				
Grouting:				

Depth to Water

Depth: _____ Date: _____ Time: _____

Well Construction Materials

	Grout	Seals	Filter
Quantity:			
Type:			

Screen

Size: 10 Config.: .010 slot
Area/Ft. .17gal/Ft Comp.: ~~Sch~~ Sch 40
Inside Diam.: 2" Outside Diam.: ~~2~~ PVC

Comments

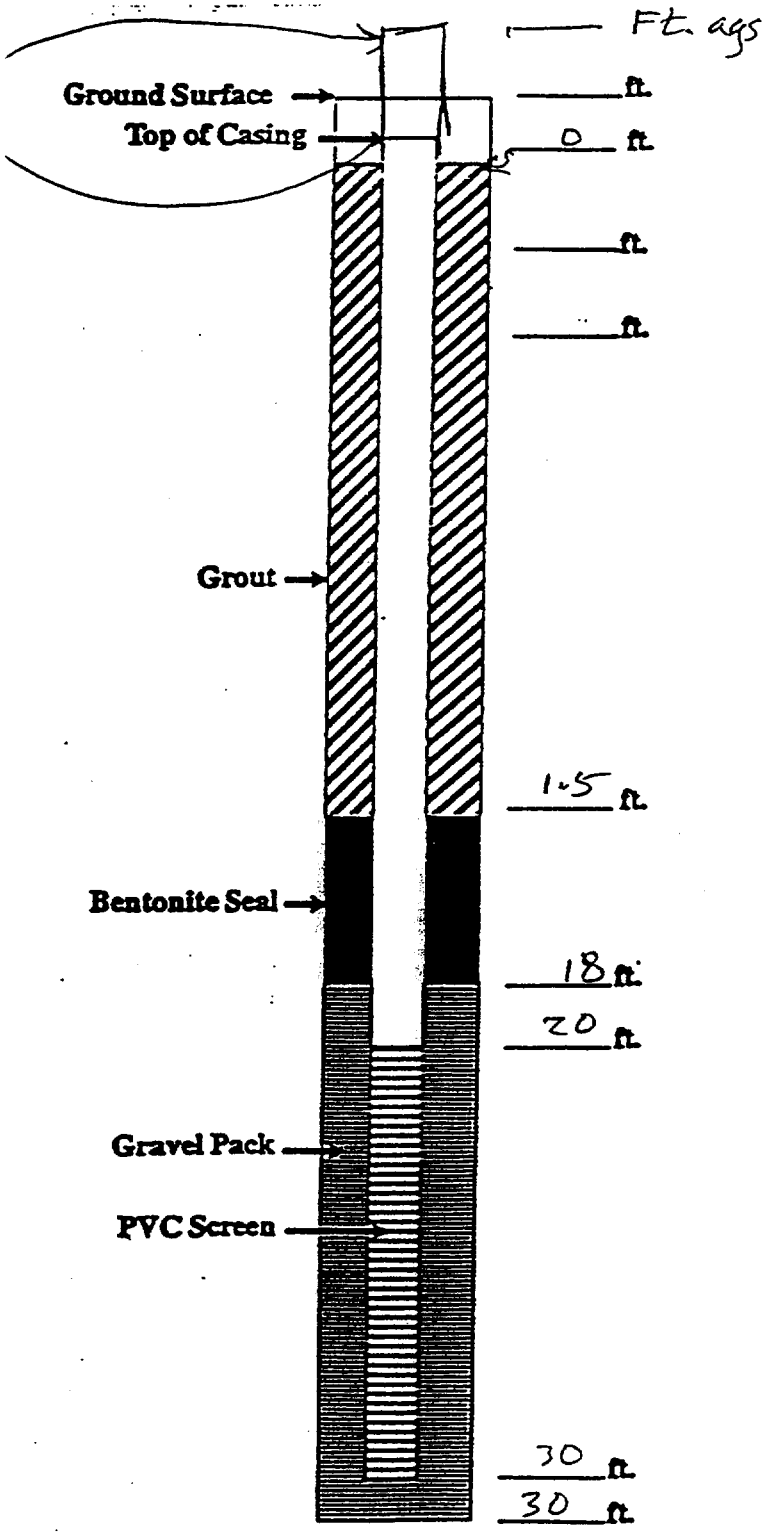
Riser Protector Mount

WELLLOGF.CDR RB 4/14/93

Walsh & Associates, Inc.
Environmental Scientists and Engineers

WELL CONSTRUCTION LOG

Job No. 3026-010 **Well No.** TH-27



Measuring point is top of CASING unless otherwise noted

Drilling Summary

Total Depth of Hole: 30'
Hole Diameter: ____
Drilling Company: Site Services
Driller: Tony / Jacobs
Rig Type: CME-55
Bits: HSA, 2' SS sampler
Geologist: V. D. Seconac

Construction Time Log

	Start Date	Start Time	Finish Date	Finish Time
Drilling:				
Screen Placement:				
Filter Placement:				
Seal Placement:				
Grouting:				

Depth to Water

Depth: ____ Date: ____ Time: ____

Well Construction Materials

	Grout	Seals	Filter
Quantity:			
Type:			

Screen

Size: 10' Config.: .010 slot
Area/Ft. .17 gal/Ft Comp.: sch 40
Inside Diam.: 2" Outside Diam.: PVC

Comments

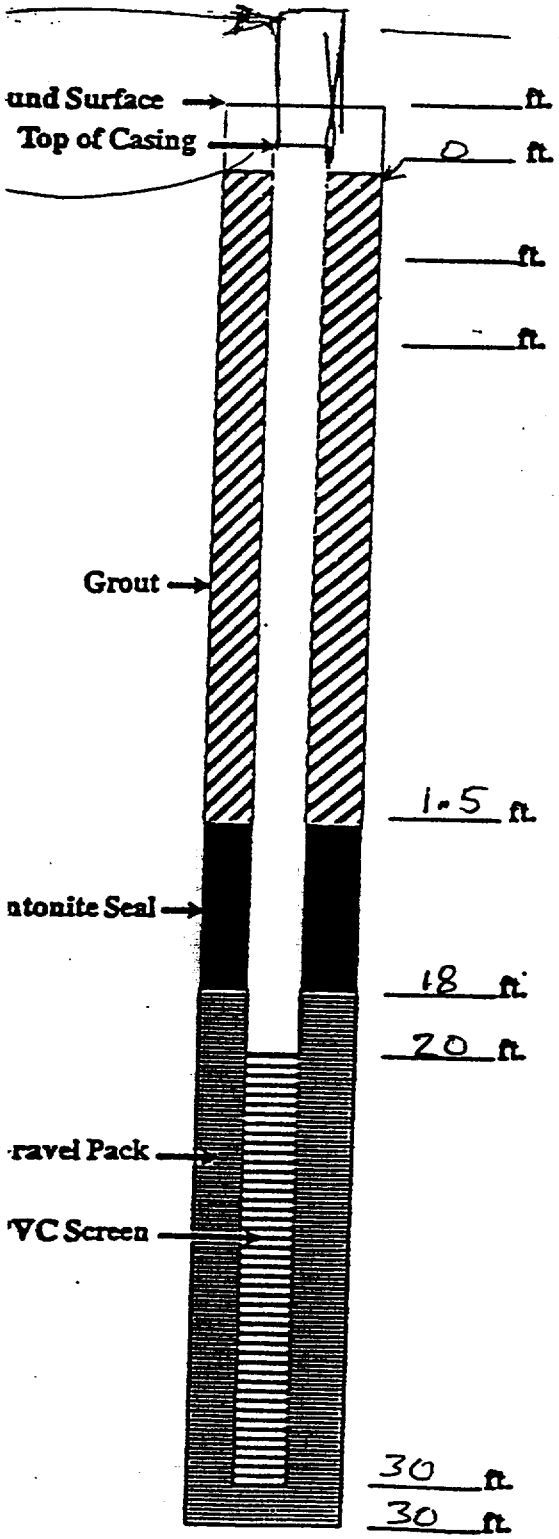
Riser Protective Mount

WELLLOG.CDR RB 4/14/93

Falsh & Associates, Inc.
ntal Scientists and Engineers

WELL CONSTRUCTION LOG

• 3026-010 Well No. TH-28



Measuring point is top of CASING unless otherwise noted

Drilling Summary

Total Depth of Hole: 30'
Hole Diameter: ____
Drilling Company: Site Services
Driller: TONY / Geoff
Rig Type: CME - 55
Bits: HSA, 2' SS samples
Geologist: V. A. Secondo

Construction Time Log

	Start Date	Start Time	Finish Date	Finish Time
Drilling:	____	____	____	____
Screen Placement:	____	____	____	____
Filter Placement:	____	____	____	____
Seal Placement:	____	____	____	____
Grouting:	____	____	____	____

Depth to Water

Depth: ____ Date: ____ Time: ____

Well Construction Materials

	Grout	Seals	Filter
Quantity:	____	____	____
Type:	____	____	____

Screen

Size: 10' Config.: 0.010 slot
Area/Ft. .17 gal/Ft Comp.: Sch 40
Inside Diam.: 2" Outside Diam.: PVC

Comments

Riser Protective Mound

WELLLOGF.CDR RB 4/14/93

APPENDIX D

FIELD DATA TRANSMITTAL SHEETS

GROUND-WATER SAMPLING FIELD DATA SHEET

lumber TH-26
g Diameter 2"
nnel VAS
umber ~~58678, 79, 80~~ VAS
58390, 91, 92

Project Number 3026-010
Project Name I-70 / Brighton
Date 6/23/99
Time 0800

tickup	Sampling kit	pH 7.00			
		Actual	Adjust	Temp	Time
46"	Hydac #3				
	Solinst #2				
	MMC —				
ter Level (up) (ft) 31.7	Conductivity Time Std = Actual = @ °F	pH 10.00			
		Actual	Adjust	Temp	Time
Depth up) (ft) 34.3	Clear Bailer Result	Purging Equipment Disp. Bailer			
Thickness 2.6	Sample Depth (ft)	Sampling Equipment " "			
ume .4	REMEMBER: 2" well multiply by .17 4" well multiply by .66				

Casing Volumes	Gallons Removed	Temperature °F	Conductivity uS/cm	pH	Comments
0	INITIAL	67	1060	6.9	Silty Brown no odor
1	.4	65.8	940	6.11	Silty; Brown no odor
2	.8	63.1	920	5.88	Silty Brown no odor
3	1.2	62.6	900	5.72	Silty Brown no odor
4	1.6	61.5	880	5.64	Silty; Brown no odor
5	2.0	62.2	960	5.59	Silty Brown no odor
↓	" "				
Sample					

s:

Collected by: VAS/EC
Checked by:

l for:

/H/TEH	BTEX	THE	TVH	OTHER
		X		VOCs

GROUND-WATER SAMPLING FIELD DATA SHEET

Number TH-27
ng Diameter 2"
onnel VPS
Number ~~54001, 02, 03~~ VPS
58393, 58394, 95

Project Number 3026-010
Project Name I-70/Brighton
Date 2/23/99
Time 0830

Stickup	Sampling kit	pH 7.00			
		Actual	Adjust	Temp	Time
46"	Hydac #3				
	Solinst #2				
	MMC				
ater Level ckup) (ft) 33.6	Conductivity Time Std = Actual = @ °F	pH 10.00			
		Actual	Adjust	Temp	Time
l Depth kup) (ft) 34.1	Clear Bailer Result	Purging Equipment Disp. Bailer			
l Thickness .5	Sample Depth (ft)	Sampling Equipment " "			
olume —	REMEMBER: 2" well multiply by .17 4" well multiply by .66				

Casing Volumes	Gallons Removed	Temperature °F	Conductivity uS/cm	pH	Comments
0					
1					
2					
3					
4					
5					
↓	- -				
Sample					

s: NO C.V's removed. Grab samples due to low H_2O quantity.
l for: TEH Sample 3/4 Full

Collected by: VPS/EC
Checked by:

/H/TEH	BTEX	THE	TVH	OTHER
		X		VOCs

GROUND-WATER SAMPLING FIELD DATA SHEET

Number TH-28
ng Diameter 2"
onnel VPS
Number ~~54684, 86, 86~~ VPS
58396, 97, 98

Project Number 3026-010
Project Name I-70/Brighton
Date 6/23/99
Time 0914

Stickup	Sampling kit	pH 7.00			
		Actual	Adjust	Temp	Time
	Hydac #3				
	Solinst #2				
	MMC				
Water Level (ickup) (ft) 31.8	Conductivity Time Std = Actual = @ °F	pH 10.00			
		Actual	Adjust	Temp	Time
ell Depth (ckup) (ft) 34.08	Clear Bailer Result	Purging Equipment Disp. Bailer			
d Thickness 2.28	Sample Depth (ft)	Sampling Equipment " "			
olume .4	REMEMBER: 2" well multiply by .17 4" well multiply by .66				

	Casing Volumes	Gallons Removed	Temperature °F	Conductivity uS/cm	pH	Comments
	0	Initial	70.2	1240	5.93	Clear→slightly turbid no odor
	1	.4	65.4	1140	5.57	Brown silty no odor
	2	.8	63.6	1120	5.49	Brown/silty no odor
	3	1.2	63.2	1090	5.39	Brown/silty no odor
	4	1.6	62.4	1100	5.33	Brown/silty no odor
	5	2.0	63.4	1050	5.33	Brown silty no odor
	↓	- -				
	Sample					

:s:

Collected by: VPS
Checked by:

d for:

VH/TEH	BTEX	THE	TVH	OTHER
		X		8260 VOCs

GROUND-WATER SAMPLING FIELD DATA SHEET

lumber [redacted] TH-7(W)
g Diameter 2"
nnel VK
umber

Project Number 3026 010
Project Name I-70 / Brighton Blvd.
Date 3/23/99
Time

Stickup	Sampling kit	pH 7.00			
		Actual	Adjust	Temp	Time
	Hydac #2				
	Solinst #5				
	MMC				
ater Level kup) (ft) 27.80	Conductivity Time Std = Actual = @ °F	pH 10.00			
		Actual	Adjust	Temp	Time
ll Depth kup) (ft) 37.91	Clear Bailer Result	Purging Equipment Disp. Bailer			
Thickness 10.11	Sample Depth (ft)	Sampling Equipment " "			
olume 1.7	REMEMBER: 2" well multiply by .17 4" well multiply by .66				

	Casing Volumes	Gallons Removed	Temperature °F	Conductivity uS/cm	pH	Comments
	INITIAL	0	62.7	8960	11.15	Clear
	1	1.7	58.1	8780	8.79	" odor??
	2	3.4	56.0	7820	8.75	Turbid, lt. brn, odor??
	3	5.1	56.1	7380	8.64	" "
	↓					
	Sample					

ks:

Collected by: VK
Checked by:

ed for:

TVH/TEH	BTEX	THE	TVH	OTHER
		X	X	8260 VOCs

©

GROUND-WATER SAMPLING FIELD DATA SHEET

ll Number TH-19
sing Diameter 2" ID.
sonnel VR
Number

Project Number 3026-010
Project Name I-704 Brighton Blvd.
Date 03/23/99
Time 0734

g Stickup	Sampling kit	pH 7.00			
		Actual	Adjust	Temp	Time
	Hydac #2	7.81	7.0	38.2	0740
	Solinst #5				
	MMC				
: Water Level stickup) (ft) 29.49	Conductivity Time Std = 1000 Actual = 1010 @ 420. hF	pH 10.00			
		Actual	Adjust	Temp	Time
		10.21	10.0	39.1	0741
Well Depth stickup) (ft) 33.9	Clear Bailer Result	Purging Equipment Disp. Bailer			
ated Thickness 4.41	Sample Depth (ft)	Sampling Equipment " "			
g Volume .75	REMEMBER: 2" well multiply by .17 4" well multiply by .66				

ne	Casing Volumes	Gallons Removed	Temperature °F	Conductivity uS/cm	pH	Comments
58	INITIAL	0	52.3	1490	9.91	Clear, slt. turbid towards bip. NO H.C. odor.
00	1	.75	54.0	1490	9.21	Rust orange NO H.C. odor
02	2	1.5	54.7	1550	9.11	" "
06	3	2.25	54.8	1620	9.09	" "
8	Sample					

arks:

Collected by: VR
Checked by:

pled for:

EX/TVH/TEH	BTEX	THE	TVH	OTHER
		X	X	8260 VOCs

GROUND-WATER SAMPLING FIELD DATA SHEET

Number TH-24
ng Diameter 2" ID
onnel VAS
Number

Project Number 3026-010
Project Name I-70 / Brighton Blvd.
Date 3/23/99
Time 0955

) Stickup	Sampling kit	pH 7.00			
		Actual	Adjust	Temp	Time
	Hydac #2				
	Solinst #5				
	MMC				
Water Level (tickup) (ft) 29.27	Conductivity Time Std = Actual = @ °F	pH 10.00			
		Actual	Adjust	Temp	Time
Well Depth (tickup) (ft) 35.10	Clear Bailer Result	Purging Equipment Disp. Bailer			
ed Thickness 5.83	Sample Depth (ft)	Sampling Equipment " "			
Volume 1.0	REMEMBER: 2" well multiply by .17 4" well multiply by .66				

	Casing Volumes	Gallons Removed	Temperature °F	Conductivity uS/cm	pH	Comments
5	INITIAL	0	64.6	1920	9.61	clear to slt. turbid, NO HC odor
7	1	1	61.5	1810	9.47	Rust orange.
1	2	2	60.9	1950	9.47	" " 4
3	3	3	61.0	1840	9.37	" " 4
5	Sample					

rks:

Collected by: VAS
Checked by:

led for:

/TVH/TEH	BTEX	THE	TVH	OTHER
		X	X	8260 VOCs

GROUND-WATER SAMPLING FIELD DATA SHEET

ell Number TH-25
sing Diameter 2" I.D.
rsonnel VAS
g Number

Project Number 3026-010
Project Name I-70 / Brighton Blvd
Date 3/23/94
Time 1044

ing Stickup	Sampling kit	pH 7.00			
		Actual	Adjust	Temp	Time
	Hydac #2				
	Solinst #5				
	MMC				
ic Water Level n stickup) (ft) 28.82	Conductivity Time Std = Actual = @ °F	pH 10.00			
		Actual	Adjust	Temp	Time
l Well Depth n stickup) (ft) 34.98	Clear Bailer Result	Purging Equipment Disp. Bailer			
rated Thickness 6.16	Sample Depth (ft)	Sampling Equipment " "			
ng Volume 1.0	REMEMBER: 2" well multiply by .17 4" well multiply by .66				

me	Casing Volumes	Gallons Removed	Temperature °F	Conductivity uS/cm	pH	Comments
54	INITIAL	0	63.5	1960	9.25	clear
58	1	1.0	58.3	1810	9.50	Rust-orange
2	2	2.0	58.1	1870	9.10	" "
05	3	3.0	57.5	1840	9.07	" "
	↓					
	↓					
	↓					
07	Sample					

narks:

Collected by: VAS
Checked by:

npled for:

TEX/TVH/TEH	BTEX	THE	TVH	OTHER
		X	X	8260 VOCs

APPENDIX E

SURVEY DATA

C7419 Walsh Environmental Scientists & Engineers *(Proj. No. 3026-010)*

Unit: fts
Coordinate Type: Geodetic
Reference Ellipsoid: WGS-1984
Projection Set: CO-CEN-83
Datum: NAD-83 ('92 Adj)/NAVD-88

#301, 39-46-46.08393 N, 104-57-59.67069, 5189.638 Top of PVC
TH-28
#351, 39-46-46.08319 N, 104-57-59.66592, 5186.095
Set "X" on Concrete Base

#302, 39-46-45.01935 N, 104-58-00.26886, 5191.736 Top of PVC
TH-27
#352, 39-46-45.02431 N, 104-58-00.27362, 5188.142
Set "X" on Concrete Base

#303, 39-46-43.45441 N, 104-58-01.53681, 5190.188 Top of PVC
TH-26
#353, 39-46-43.45237 N, 104-58-01.53782, 5186.619
Set "X" on Concrete Base

#311, 39-46-42.47983 N, 104-58-03.96050, 5189.842 Top of PVC
PZ-1

#312, 39-46-42.47823 N, 104-58-03.23252, 5190.608 Top of PVC
PZ-2

#313, 39-46-42.81011 N, 104-58-03.64789, 5190.084 Top of PVC
PZ-3

#314, 39-46-42.98182 N, 104-58-03.26159, 5190.440 Top of PVC
PZ-4

325 Interlocken Parkway
Suite 200
Broomfield, CO 80021
(303) 469-8868
(800) 873-8707
FAX: (303) 469-5254

ICA
NTAL
UES
company

Environmental Inc.
Pearl East Circle #108
er CO 80301

Stan Spencer

Order #: 99-06-215
Date: 06/27/99 16:15
Work ID: 3026-010 44TH & BRIGHTON
Date Received: 06/17/99
Date Completed: 06/24/99

SAMPLE IDENTIFICATION

Client Description	Sample Number	Client Description
TH-26 TAG #58380	02	TH-28 TAG #58382

ed are the analytical results for the submitted sample(s). Please
the CASE NARRATIVE for a discussion of any data and/or quality
l issues. A listing of data qualifiers and analytical codes is
d on the TEST METHODOLOGIES page at the end of the report.

have any questions regarding the analyses, please feel free to call.

ely,

K. Toon
Manager

es were prepared and analyzed according to methods outlined in the
wing references:

Test Methods for Evaluating Solid Waste, USEPA SW-846, Third Edition, Revision 4, December 1996.

Standard Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures, ASTM D 2216-80, July 1980.

ems encountered with the analyses are discussed in the following narrative.

atrix spike recovery for the batched lead quality control sample was below ower control limit. All other quality assurance analyses were acceptable.

APPENDIX F

LABORATORY DATA & CHAIN OF CUSTODY

Sample: 01A TH-26 TAG #58380 Collected: 06/16/99 Matrix: SOIL

Test Description	Method	Result	Q	Limit	Units	Analyzed
Arsenic, Total	SW 7060	38	DS	2.4	mg/Kg-DRY	06/23/99
Lead, Total	SW 7421	850	D	24	mg/Kg-DRY	06/23/99
Percent Moisture	ASTM D2216	16.5		0.1	WT%	06/23/99

Sample: 02A TH-28 TAG #58382 Collected: 06/17/99 Matrix: SOIL

Test Description	Method	Result	Q	Limit	Units	Analyzed
Arsenic, Total	SW 7060	15	DS	1.4	mg/Kg-DRY	06/23/99
Lead, Total	SW 7421	140	D	2.9	mg/Kg-DRY	06/23/99
Percent Moisture	ASTM D2216	30.6		0.1	WT%	06/23/99

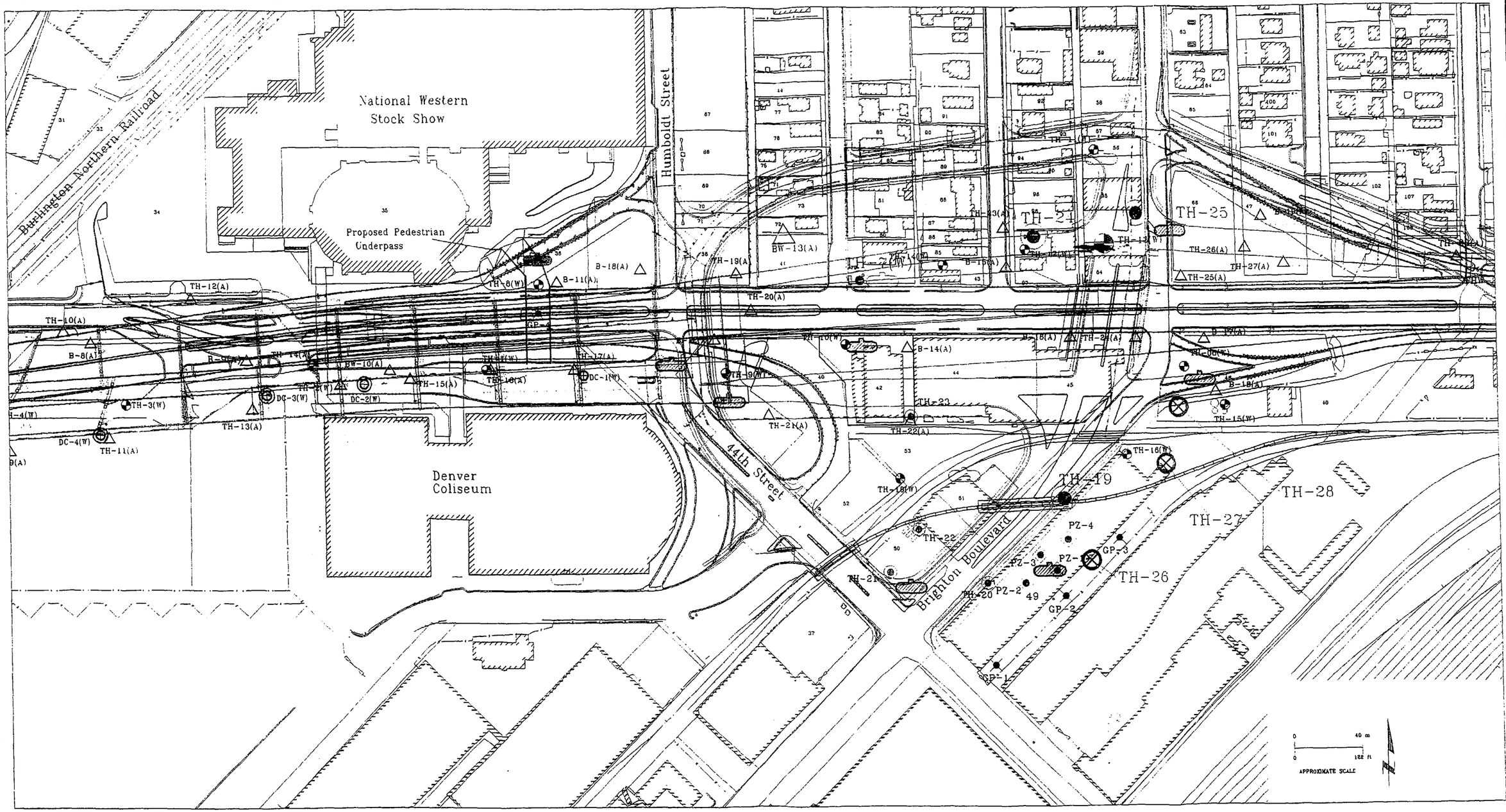
THE FOLLOWING CODES APPLY TO THE ANALYTICAL REPORT

:SULT field...
ND = not detected at the reported limit
NA = analyte not applicable (see case narrative/methods for discussion)

(qualifier) field...
:ENERAL:
* = Recovery or %RPD outside method specifications
H = value is estimated due to analysis run outside EPA holding times
E = reported concentration is above the instrument calibration range
D = analyte was diluted to bring within instrument calibration range or to remove matrix interferences

RGANIC ANALYSIS DATA QUALIFIERS:
B = analyte was detected in the laboratory method blank
J = analyte was detected above the instrument detection limit (IDL) but below the analytical reporting limit (CRDL)

NORGANIC ANALYSIS DATA QUALIFIERS:
B = analyte was detected above the instrument detection limit (IDL) but below the analytical reporting limit (CRDL)
W = post digestion spike did not meet criteria (85-115%)
S = reported value determined by the Method of Standard Additions



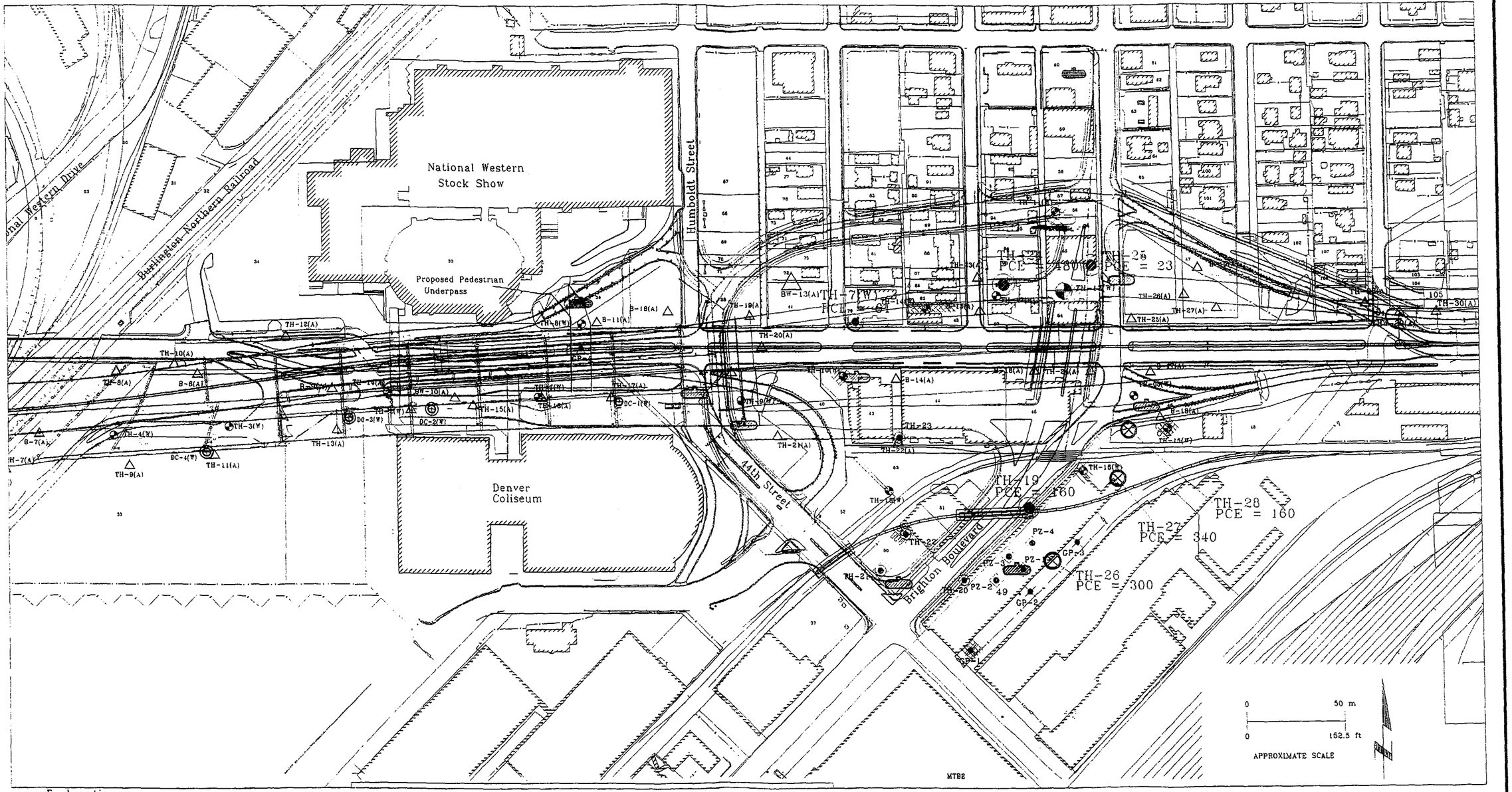
Explanation

- Washington Street Shallow Soil Boring (Walsh, 1997)
- Denver Coliseum Area Test Holes (Walsh, 1997)
- Denver Coliseum Area Test Holes (Walsh, 1997) Completed as Monitor Wells
- Walsh Monitor Well (1991)
- Aguirre Geotechnical Hole (1994,1995)
- Walsh Geoprobe Soil Sample Site, 1998
- Walsh Test Hole, 1998
- Approximate Property Boundary and ID Number
- Former Aboveground Storage Tank(s)
- Former Underground Storage Tank(s)
- Underground Storage Tank(s) - Removal Unknown
- Underground Storage Tank(s)
- Former Barrel Storage
- Approximate Location of Former Gas Station Tank Type (UST or AST) Unknown, UST Removal Unknown
- Walsh Test Hole, 1999
- Proposed Monitoring Well
- Walsh Monitoring Well (1991) Sampling Location
- Walsh Test Hole, 1998 Sampling Location
- Aguirre Geotechnical Hole (1994, 1995) Sampling Location
- Proposed sidewalks and riprap
- Proposed curbs and gutters
- Proposed retaining walls
- Proposed storm and/or sanitary sewers
- Proposed gas
- Proposed telephone
- Proposed water line

Walsh
Environmental Scientists and Engineers, Inc.

Site Map With
Test Hole Location

Job 3026-010 | Date 9/99 | Figure 2



Explanation

- Washington Street Shallow Soil Boring (Walsh, 1997)
- Denver Coliseum Area Test Holes (Walsh, 1997)
- Denver Coliseum Area Test Holes (Walsh, 1997) Completed as Monitor Wells
- Walsh Monitor Well (1991)
- Aguirre Geotechnical Hole (1994,1995)
- Walsh Geoprobe Soil Sample Site, 1998
- Walsh Test Hole, 1998
- Approximate Property Boundary and ID Number
- Former Aboveground Storage Tank(s)
- Former Underground Storage Tank(s)
- Underground Storage Tank(s) - Removal Unknown
- Underground Storage Tank(s)
- Approximate Location of Former Gas Station Tank Type (UST or AST) Unknown, UST Removal Unknown
- Former Barrel Storage
- Walsh Test Hole, 1999
- Proposed Monitoring Well
- Walsh Monitoring Well (1991) Sampling Location
- Walsh Test Hole, 1998
- PCE Concentration
- Aguirre Geotechnical Hole (1994, 1995) Sampling Location
- Proposed sidewalks and riprap
- Proposed curbs and gutters
- Proposed retaining walls
- Proposed storm and/or sanitary sewers
- Proposed gas
- Proposed telephone
- Proposed water line

Walsh
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PCE Concentrations
In Ground Water

Job 3026-010	Date 9/99	Figure 3

3008m01d.dwg 8/25/98 PB, mod. 9/14/99 rtm

3026-010; TH-26 25-27' bgs

Client Sample ID

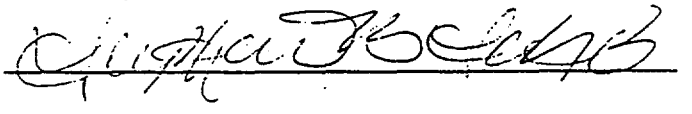
Sample Tag No: 58376
Lab Sample ID: S-99-6-35-2
Matrix: Soil
Date Sampled: 06/17/99
Data Filename: VOAA3404.D

EPA Method: 8260
Date Analyzed: 06/22/99
Analyst: SBS
Units: µg/Kg
Dilution Factor: 1

Tentatively Identified Compound	Concentration	Qualifier
No Tentatively Identified Compounds were detected.		

Qualifier:

"T" Indicates compound was tentatively identified by its mass spectrum.
All tentatively identified compounds are estimated values.

Analyst: 

Walsh
Environmental Scientists and Engineers, Inc.

Petroleum Hydrocarbons Report

3026-010; TH-26 0-1' bgs
Client Sample ID

ORIGINAL

thod: Mod. 8100
ıple ID: 99-6-35-3
Soil
ıber: 59673
ımpled: 6/16/99

Analyst: SBS
Date Extracted: 6/29/99
Extractables Date Analyzed: 7/1/99
Units: mg/Kg

Extractables Dilution Factor: 1

	CAS Number	Concentration	Detection Limits	Qualifier
tractable Hydrocarbons	NA	11	3	

Surrogate Compound	%Recovery
(SS) o-Terphenyl	115 %

Qualifiers:

"U" Indicates compound was searched for and not detected at or above the method detection limit.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
" * " Indicates surrogate is outside of recovery limits due to matrix effect.

Analyst: _____

Walsh
l Scientists and Engineers, Inc.

3050_G:	Acid Digestion of Sediments, Sludges, and Soils for GFAA Metals	METHOD: 3050A
AS_GTS:	ARSENIC, Total (GFAA)	METHOD: 7060
PB_GTS:	LEAD, Total (GFAA)	METHOD: 7421
PMOIST:	PERCENT MOISTURE	METHOD: ASTM D2216

Petroleum Hydrocarbons Report

3026-010; TH-26 25-27' bgs

Client Sample ID

ORIGINAL

EPA Method: Mod. 8100
Lab Sample ID: 99-6-35-2
Matrix: Soil
Tag Number: 58025
Date Sampled: 6/17/99

Analyst: SBS
Date Extracted: 6/29/99
Extractables Date Analyzed: 7/1/99
Units: mg/Kg

Extractables Dilution Factor: 1

Analyte	CAS Number	Concentration	Detection Limits	Qualifier
Total Extractable Hydrocarbons	NA		3	U

Surrogate Compound	%Recovery
(SS) o-Terphenyl	108 %

Qualifiers:

"U" Indicates compound was searched for and not detected at or above the method detection limit.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
" * " Indicates surrogate is outside of recovery limits due to matrix effect.

Analyst:

Walsh
Environmental Scientists and Engineers, Inc.

es were prepared and analyzed according to methods outlined in the
wing references:

Test Methods for Evaluating Solid Waste, USEPA SW-846, Third Edition, Revision 4, December 1996.

Standard Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures, ASTM D 2216-80, July 1980.

ems encountered with the analyses are discussed in the following narrative.

atrix spike recovery for the batched lead quality control sample was below ɔwer control limit. All other quality assurance analyses were acceptable.

ANALYTICA
ENVIRONMENTAL
LABORATORIES
an Analytica Group company

325 Interlocken Parkway
Suite 200
Broomfield, CO 80021
(303) 469-8868
(800) 873-8707
FAX: (303) 469-5254

Walsh Environmental Inc.
4888 Pearl East Circle #108
Boulder CO 80301

Attn: Stan Spencer

Order #: 99-06-226
Date: 06/27/99 16:10
Work ID: 3026-010 I-70 / BRIGHTON BLVD
Date Received: 06/18/99
Date Completed: 06/24/99

SAMPLE IDENTIFICATION

Sample Number	Client Description	Sample Number	Client Description
01	TH-27 TAG #58381		

Enclosed are the analytical results for the submitted sample(s). Please review the CASE NARRATIVE for a discussion of any data and/or quality control issues. A listing of data qualifiers and analytical codes is located on the TEST METHODOLOGIES page at the end of the report.

If you have any questions regarding the analyses, please feel free to call.

Sincerely,

Claire K. Toon

Claire K. Toon
Project Manager

e: 01A TH-27 TAG #58381 Collected: 06/18/99 Matrix: SOIL

Description	Method	Result	Q	Limit	Units	Analyzed
ic, Total	SW 7060	4.7	DS	0.47	mg/Kg-DRY	06/23/99
Total	SW 7421	68	D	2.4	mg/Kg-DRY	06/23/99
nt Moisture	ASTM D2216	14.9		0.1	WT%	06/23/99

THE FOLLOWING CODES APPLY TO THE ANALYTICAL REPORT

ESULT field...
ND = not detected at the reported limit
NA = analyte not applicable (see case narrative/methods for discussion)

(qualifier) field...
GENERAL:
* = Recovery or %RPD outside method specifications
H = value is estimated due to analysis run outside EPA holding times
E = reported concentration is above the instrument calibration range
D = analyte was diluted to bring within instrument calibration range or to remove matrix interferences

ORGANIC ANALYSIS DATA QUALIFIERS:
B = analyte was detected in the laboratory method blank
J = analyte was detected above the instrument detection limit (IDL) but below the analytical reporting limit (CRDL)

NORGANIC ANALYSIS DATA QUALIFIERS:
B = analyte was detected above the instrument detection limit (IDL) but below the analytical reporting limit (CRDL)
W = post digestion spike did not meet criteria (85-115%)
S = reported value determined by the Method of Standard Additions

_G:	Acid Digestion of Sediments, Sludges, and Soils for GFAA Metals	METHOD: 3050A
TS:	ARSENIC, Total (GFAA)	METHOD: 7060
TS:	LEAD, Total (GFAA)	METHOD: 7421
ST:	PERCENT MOISTURE	METHOD: ASTM D2216

QA/QC REPORT

METHOD BLANK SUMMARY

T: JP_WALSH

06/27/99

ORDER#: 9906226

ALYTE	UNITS	ANAL DATE	RESULT	LIMIT
SENIC, Total	mg/Kg	06/23/99	ND	0.20
AD, Total	mg/Kg	06/23/99	ND	0.10

METHOD BLANK SPIKE SUMMARY

ALYTE	UNITS	ANAL DATE	RESULT	LIMIT	SPIKE	REF VAL	%REC	FLAG	QC SPECS LOW	QC SPECS UPPER
SENIC, Total	mg/Kg	06/23/99	3.8	0.20	4.0	ND	95.0		80	120
AD, Total	mg/Kg	06/23/99	1.9	0.10	2.0	ND	95.0		80	120

MATRIX SPIKE SUMMARY

ALYTE	UNITS	ANAL DATE	RESULT	LIMIT	SPIKE	REF VAL	%REC	FLAG	QC SPECS LOW	QC SPECS UPPER
SENIC, Total	mg/Kg	06/23/99	6.9	0.20	4.0	3.8	77.5		70	130
AD, Total	mg/Kg	06/23/99	5.8	0.20	2.0	5.0	40.0	*	70	130

SAMPLE DUPLICATE SUMMARY

ALYTE	UNITS	ANAL DATE	RESULT	LIMIT	REF VAL	%RPD	FLAG	QC SPECS UPPER
SENIC, Total	mg/Kg	06/23/99	3.9	0.20	3.8	2.60		35
AD, Total	mg/Kg	06/23/99	4.9	0.20	5.0	2.02		35

e: 01A TH-27 TAG #58381 Matrix: SOIL

	Method	Collected	Received	TCLP date	Extracted	Analyze
Total	SW 7060	06/18/99	06/18/99	NA	06/21/99	06/23/9
:al	SW 7421	06/18/99	06/18/99	NA	06/21/99	06/23/9
ioisture	ASTM D2216	06/18/99	06/18/99	NA		06/23/9

C:\HPCHEM\1\DATA\070699\BNAB1268.D

ORIGINAL

3026-010; TH-27 0-1'bgs

Client Sample ID

Sample Tag No: 58389
Lab Sample ID: S-99-6-37-3
Matrix: Soil
Date Extracted: 6/18/99
Data Filename: BNAB1268.D

Date Analyzed: 06/06/99
Analyst: SBS
Dilution Factor: 1
EPA Method: 8270
Units: µg/Kg

Analyte	CAS Number	Concentration	Quantitation Limits	Qualifier
N-Nitrosodimethylamine	62-75-9		660	U
Phenol	108-95-2		330	U
Bis(2-chloroethyl)ether	111-44-4		330	U
2-Chlorophenol	95-57-8		330	U
1,3-Dichlorobenzene	541-73-1		330	U
1,4-Dichlorobenzene	106-46-7		330	U
Benzyl Alcohol	100-51-6		660	U
1,2-Dichlorobenzene	95-50-1		330	U
2-Methylphenol	95-48-7		330	U
Bis(2-chloroisopropyl)ether	108-60-1		330	U
4-Methylphenol	106-44-5		330	U
N-nitrosodi-n-propylamine	621-64-7		330	U
Hexachloroethane	67-72-1		330	U
Nitrobenzene	98-95-3		330	U
Isophorone	78-59-1		330	U
2-Nitrophenol	88-75-5		330	U
2,4-Dimethylphenol	105-67-9		330	U
Bis(2-chloroethoxy)methane	111-91-1		330	U
Benzoic Acid	65-85-0		1,650	U
2,4-Dichlorophenol	120-83-2		330	U
1,2,4-Trichlorobenzene	120-82-1		330	U
Naphthalene	91-20-3		330	U
4-Chloroaniline	106-47-8		660	U
Hexachlorobutadiene	87-68-3		330	U
4-Chloro-3-methylphenol	59-50-7		660	U
2-Methylnaphthalene	91-57-6		330	U
Hexachlorocyclopentadiene	77-47-4		330	U
2,4,6-Trichlorophenol	88-06-2		330	U
2,4,5-Trichlorophenol	95-95-4		330	U
2-Chloronaphthalene	91-58-7		330	U
2-Nitroaniline	88-74-4		1,650	U
Dimethyl Phthalate	131-11-3		330	U
Acenaphthylene	208-96-8		330	U
3-Nitroaniline	99-09-2		1,650	U
Acenaphthene	83-32-9		330	U
2,4-Dinitrophenol	51-28-5		1,650	U
4-Nitrophenol	100-02-7		1,650	U

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C:\HPCHEM\1\DATA\070699\BNAB1268.D

ORIGINAL

3026-010; TH-27 0-1'bgs

Lab Sample ID: S-99-6-37-3

Client Sample ID:

Dibenzofuran	132-64-9		330	U
2,4-Dinitrotoluene	606-20-2		330	U
2,6-Dinitrotoluene	121-14-2		330	U
Diethylphthalate	84-66-2		330	U
4-Chlorophenyl phenyl ether	7005-72-3		330	U
Fluorene	86-73-7		330	U
4-Nitroaniline	100-01-6		660	U
4,6-Dinitro-2-methylphenol	534-52-1		1,650	U
N-Nitrosodiphenylamine	86-30-6		330	U
4-Bromophenyl-phenylether	101-55-3		330	U
Hexachlorobenzene	118-74-1		330	U
Pentachlorophenol	87-86-5		1,650	U
Phenanthrene	85-01-8		330	U
Anthracene	120-12-7		330	U
Carbazole	86-74-8		660	U
Di-n-butylphthalate	84-74-2		330	U
Fluoranthene	206-44-0		330	U
Pyrene	129-00-0		330	U
Butylbenzylphthalate	85-68-7		330	U
Benzo(a)anthracene	56-55-2		330	U
Chrysene	218-01-9		330	U
3,3'-Dichlorobenzidine	91-94-1		1,650	U
Bis(2-ethylhexyl)phthalate	117-81-7		330	U
Di-n-octylphthalate	117-84-0		330	U
Benzo(b)fluoranthene	205-99-2		330	U
Benzo(k)fluoranthene	207-8-9		330	U
Benzo(a)pyrene	50-32-8		330	U
Indeno(1,2,3-cd)pyrene	193-39-5		660	U
Dibenz(a,h)anthracene	53-70-3		660	U
Benzo(g,h,i)perylene	191-24-2		660	U

Surrogate Compound	%Rec		Limits (%)
(SS) 2-Fluorophenol	**85 %**		25 — 121
(SS) Phenol-d5	**70 %**		24 — 113
(SS) Nitrobenzene-d5	**83 %**		23 — 120
(SS) 2-Fluorobiphenyl	**104 %**		30 — 115
(SS) 2,4,6-Tribromophenol	**91 %**		19 — 122
(SS) Terphenyl-d14	**141 %**	*	18 — 137

Qualifiers: "U" Indicates compound was searched for and not detected.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
"*" Indicates surrogates low due to matrix effect.

Note: Method detection limits are approximately 1/5 of reporting limits.

Walsh

Environmental Scientists and Engineers, Inc.

C:\HPCHEM\1\DATA\070699\BNAB1268.D

ORI...

3026-010; TH-27 0-1'bgs

Client Sample ID

Sample Tag No: 58389
Lab Sample ID: S-99-6-37-3
Matrix: Soil
Data Filename: BNAB1268.D

Date Analyzed: 06/06/99
Analyst: SBS
Dilution Factor: 1
Method: 8270
Units: µg/Kg

Tentatively Identified Compound	Concentration	Qualifier
Unknown Organic Compound	160	TJB
Unknown Organic Compound	240	TJB
2-Cyclohexen-1-one	170	TJ
Unknown Organic Compound	2100	TJB
Unknown Organic Compound	250	TJ
Unknown Organic Compound	440	TJ
Unknown Organic Compound	370	TJ
Unknown Organic Compound	310	TJ

Qualifier:

"T" Indicates compound was tentatively identified by its mass spectrum.
All tentatively identified compounds are estimated values.

Analyst

Walsh

Environmental Scientists and Engineers, Inc.

Walsh
Environmental Scientists and Engineers, Inc.

CHAIN OF CUSTODY RECORD

№ 8186

LGN#7706226

4888 Pearl East Circle, Suite 108
Boulder Colorado 80301

STANDARD TAT — PM: STAN SPENCER

Proj. No. 3026-010 — Project Name: CDOT - I-70 / Brighton Blvd

SAMPLERS: (Signature)

Sta No	Date	Time	Soil		Station Location	Sample Tag No.	Benzene + Lead										No. of Containers	Remarks
TH-27	6/18/99	0809	X		0-1' bgs	SB3381	X										1	Boy, Ice

Relinquished by: (Sign.)	Date/Time	Received by: (Sign.)	Relinquished by: (Sign.)	Date/Time	Received by: (Sign.)
	6/18/99 12:50		6-18-99 12:55		
Relinquished by: (Sign.)	Date/Time	Received by: (Sign.)	Relinquished by: (Sign.)	Date/Time	Received by: (Sign.)
Relinquished by: (Sign.)	Date/Time	Received for Laboratory by: (Sign.)	Date/Time	Remarks:	

Walsh
Environmental Scientists and Engineers, Inc.

CHAIN OF CUSTODY RECORD

№ 8187

4888 Pearl East Circle, Suite 108
Boulder Colorado 80301

STANDARD TAT — PM: STAN SPENCER 99-6-37

Proj. No. 3026-010 — Project Name: CDOT I-70/Brighton Blvd

SAMPLERS: (Signature)

Sta No	Date	Time	Soil		Station Location	Sample Tag No.	8260 VOCs	TEPH	8270 SVOCs	Walsh #							No. of Containers	Remarks
TH-27	6/18/99	0818	X		5-7' bgs	58384	X			1							1	Tr 4 oz
TH-27		0851	X		25-27' bgs	58385	X			2							1	
TH-27		0818	X		5-7' bgs	58386		X		1							1	
TH-27		0854	X		25-27' bgs	58387		X		2							1	
TH-27		0809	X		0-1' bgs	58389			X	3							1	8 oz

Relinquished by: (Sign.)	Date/Time	Received by: (Sign.)	Relinquished by: (Sign.)	Date/Time	Received by: (Sign.)
	6/18/99 1348				

3026-010; TH-27 5-7' bgs

Client Sample ID

ORIGINAL

Sample Tag No: 58384
Lab Sample ID: S-99-6-37-1
Matrix: Soil
Date Sampled: 6/18/99
Data Filename: VOAA3411.D

EPA Method: 8260
Date Analyzed: 06/22/99
Analyst: SBS
Units: µg/Kg
Dilution Factor: 1

/te	CAS Number	Concentration	Quantitation Limits	Qualifier
ɔrodifluoromethane	75-71-8		10	UJ
omethane	74-87-3		10	UJ
Chloride	75-01-4		5	UJ
omethane	74-97-5		10	UJ
oethane	75-00-3		10	UJ
orofluoromethane	75-69-4		10	UJ
ichloroethene	75-35-4		5	UJ
/lene Chloride	75-09-2		5	UJ
1,2-Dichloroethene	156-60-5		5	UJ
ichloroethane	75-34-3		5	UJ
2-Dichloroethene	156-59-2		5	UJ
ichloropropane	594-20-7		5	UJ
ɔchloromethane	74-97-5		5	UJ
ɔform	67-66-3		5	UJ
Trichloroethane	71-55-6		5	UJ
ichloropropene	563-58-6		5	UJ
ɔn Tetrachloride	56-23-5		5	UJ
ichloroethane	107-06-2		5	UJ
ɜne	71-43-2		5	UJ
ɔroethene	79-01-6		5	UJ
ichloropropane	78-87-5		5	UJ
nomethane	74-95-3		5	UJ
ɔdichloromethane	75-27-4		5	UJ
3-Dichloropropene	10061-02-6		5	UJ
ne	108-88-3		5	UJ
1,3-Dichloropropene	10061-01-5		5	UJ
Trichloroethane	79-00-5		5	UJ
bromoethane	106-93-4		5	UJ
chloropropane	142-28-9		5	UJ
;hloroethene	127-18-4		5	UJ
nochloromethane	124-48-1		5	UJ
ɔbenzene	108-90-7		5	UJ
2-Tetrachloroethane	630-20-6		5	UJ
ɜenzene	100-41-4		5	UJ
-Xylenes			5	UJ
ɜne	106-42-3		5	UJ

Walsh

nental Scientists and Engineers, Inc.

3026-010; TH-27 5-7' bgs		Lab Sample ID: S-99-6-37-1		
Client Sample ID:				
ene	100-42-5		5	UJ
oform	75-25-2		5	UJ
opylbenzene	98-82-8		5	UJ
,2-Tetrachloroethane	79-34-5		5	UJ
obenzene	108-86-1		5	UJ
-Trichloropropane	96-18-4		5	UJ
pylbenzene	103-65-1		5	UJ
orotoluene	95-49-8		5	UJ
-Trimethylbenzene	108-67-8		5	UJ
lbenzene	98-06-6		5	UJ
-Trimethylbenzene	95-63-6		5	UJ
ylbenzene	135-98-8		5	UJ
ichlorobenzene	541-73-1		5	UJ
opylToluene	99-87-6		5	UJ
ichlorobenzene	106-46-7		5	UJ
ylbenzene	104-51-8		5	UJ
ichlorobenzene	95-50-1		5	UJ
ibromo-3-chloropropane	96-12-8		5	UJ
Trichlorobenzene	120-82-1		5	UJ
chlorobutadiene	87-68-3		5	UJ
halene	91-20-3		5	UJ
Trichlorobenzene	87-61-6		5	UJ

gate Compound		%Rec	Limits (%)
Dibromofluoromethane		102 %	80 --- 120
Toluene-d8		105 %	81 --- 117
-Bromofluorobenzene		99 %	74 --- 121

Qualifiers: "U" Indicates compound was searched for and not detected.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
"*" Indicates surrogates low due to matrix effect.

Walsh
ental Scientists and Engineers, Inc.

3026-010; TH-27 5-7' bgs

Client Sample ID

Sample Tag No: 58384
Lab Sample ID: S-99-6-37-1
Matrix: Soil
Date Sampled: 06/18/99
Data Filename: VOAA3411.D

EPA Method: 8260
Date Analyzed: 06/22/99
Analyst: SBS
Units: **µg/Kg**
Dilution Factor: 1

atively Identified Compound	Concentration	Qualifier
entatively Identified Compounds were detected.		

Qualifier:

"T" Indicates compound was tentatively identified by its mass spectrum.
All tentatively identified compounds are estimated values.

Analyst: _____

Walsh
cientists and Engineers, Inc.

3026-010; TH-27 25-27' bgs

Client Sample ID

ORIGINAL

Sample Tag No: 58385
Lab Sample ID: S-99-6-37-2
Matrix: Soil
Date Sampled: 6/18/99
Data Filename: VOAA3410.D

EPA Method: 8260
Date Analyzed: 06/22/99
Analyst: SBS
Units: µg/Kg
Dilution Factor: 1

yte	CAS Number	Concentration	Quantitation Limits	Qualifier
orodifluoromethane	75-71-8		10	UJ
omethane	74-87-3		10	UJ
Chloride	75-01-4		5	UJ
omethane	74-97-5		10	UJ
oethane	75-00-3		10	UJ
orofluoromethane	75-69-4		10	UJ
ichloroethene	75-35-4		5	UJ
lene Chloride	75-09-2		5	UJ
1,2-Dichloroethene	156-60-5		5	UJ
ichloroethane	75-34-3		5	UJ
2-Dichloroethene	156-59-2		5	UJ
ichloropropane	594-20-7		5	UJ
ochloromethane	74-97-5		5	UJ
oform	67-66-3		5	UJ
Trichloroethane	71-55-6		5	UJ
ichloropropene	563-58-6		5	UJ
n Tetrachloride	56-23-5		5	UJ
ichloroethane	107-06-2		UJ	UJ
ene	71-43-2		5	UJ
oroethene	79-01-6		5	UJ
ichloropropane	78-87-5		5	UJ
momethane	74-95-3		5	UJ
odichloromethane	75-27-4		5	UJ
3-Dichloropropene	10061-02-6		5	UJ
ne	108-88-3		5	UJ
1,3-Dichloropropene	10061-01-5		5	U
Trichloroethane	79-00-5		5	U
bromoethane	106-93-4		5	U
chloropropane	142-28-9		5	U
hloroethene	127-18-4		5	U
nochloromethane	124-48-1		5	U
benzene	108-90-7		5	U
2-Tetrachloroethane	630-20-6		5	U
enzene	100-41-4		5	U
-Xylenes			5	U
ne	106-42-3		5	U

Walsh

nental Scientists and Engineers, Inc.

3026-010; TH-27 25-27' bgs

Lab Sample ID: S-99-6-37-2

Client Sample ID:

ene	100-42-5		5	U
noform	75-25-2		5	UJ
opylbenzene	98-82-8		5	UJ
,2-Tetrachloroethane	79-34-5		5	UJ
nobenzene	108-86-1		5	UJ
-Trichloropropane	96-18-4		5	UJ
opylbenzene	103-65-1		5	UJ
lorotoluene	95-49-8		5	UJ
-Trimethylbenzene	108-67-8		5	UJ
ylbenzene	98-06-6		5	UJ
-Trimethylbenzene	95-63-6		5	UJ
tylbenzene	135-98-8		5	UJ
)ichlorobenzene	541-73-1		5	UJ
propyltoluene	99-87-6		5	UJ
)ichlorobenzene	106-46-7		5	UJ
ylbenzene	104-51-8		5	UJ
)ichlorobenzene	95-50-1		5	UJ
ibromo-3-chloropropane	96-12-8		5	UJ
-Trichlorobenzene	120-82-1		5	UJ
chlorobutadiene	87-68-3		5	UJ
thalene	91-20-3		5	UJ
-Trichlorobenzene	87-61-6		5	UJ

gate Compound		%Rec	Limits (%)
Dibromofluoromethane		**104 %**	80 — 120
Toluene-d8		**107 %**	81 — 117
o-Bromofluorobenzene		**105 %**	74 — 121

Qualifiers: "U" Indicates compound was searched for and not detected.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
"*" Indicates surrogates low due to matrix effect.

026-010; TH-27 25-27' bgs

Client Sample ID

Sample Tag No: 58387
Lab Sample ID: S-99-6-37-2
Matrix: Soil
Date Sampled: 06/18/99
Data Filename: VOAA3410.D

EPA Method: 8260
Date Analyzed: 06/22/99
Analyst: SBS
Units: µg/Kg
Dilution Factor: 1

tively Identified Compound	Concentration	Qualifier
ntatively Identified Compounds were detected.		

Qualifier:

"T" Indicates compound was tentatively identified by its mass spectrum.
All tentatively identified compounds are estimated values.

Analyst:

Walsh

ntal Scientists and Engineers, Inc.

Petroleum Hydrocarbons Report

3026-010; TH-27 5-7' bgs
Client Sample ID

ORIGINAL

Method: Mod. 8100
Sample ID: 99-6-37-1
x: Soil
Number: 58386
Sampled: 6/18/99

Analyst: SBS
Date Extracted: 6/29/99
Extractables Date Analyzed: 7/1/99
Units: mg/Kg

Extractables Dilution Factor: 1

te	CAS Number	Concentration	Detection Limits	Qualifier
Extractable Hydrocarbons	NA		3	U

Surrogate Compound	%Recovery
(SS) o-Terphenyl	115 %

Qualifiers:

"U" Indicates compound was searched for and not detected at or above the method detection limit.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
" * " Indicates surrogate is outside of recovery limits due to matrix effect.

Analyst: _____

Walsh
ental Scientists and Engineers, Inc.

Petroleum Hydrocarbons Report

3026-010; TH-27 25-27' bgs
Client Sample ID

ORIGINAL

ethod: Mod. 8100
mple ID: 99-6-37-2
Soil
mber: 58387
ampled: 6/18/99

Analyst: SBS
Date Extracted: 6/29/99
Extractables Date Analyzed: 7/1/99
Units: mg/Kg

Extractables Dilution Factor: 1

	CAS Number	Concentration	Detection Limits	Qualifier
tractable Hydrocarbons	NA		3	U

Surrogate Compound	%Recovery
(SS) o-Terphenyl	69 %

Qualifiers:

"U" Indicates compound was searched for and not detected at or above the method detection limit.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
" * " Indicates surrogate is outside of recovery limits due to matrix effect.

Analyst: _____

Walsh
Scientists and Engineers, Inc.

C:\HPCHEM\1\DATA\070699\BNAB1270.D

ORIGINAL

)26-010; TH-28 1-3' bgs

Client Sample ID

nple Tag No: 59677
b Sample ID: S-99-6-35-6
Matrix: Soil
ıte Extracted: 6/25/99
ata Filename: BNAB1270.D

Date Analyzed: 07/06/99
Analyst: SBS
Dilution Factor: 1
EPA Method: 8270
Units: µg/Kg

	CAS Number	Concentration	Quantitation Limits	Qualifier
odimethylamine	62-75-9		660	U
	108-95-2		330	U
loroethyl)ether	111-44-4		330	U
phenol	95-57-8		330	U
lorobenzene	541-73-1		330	U
lorobenzene	106-46-7		330	U
lcohol	100-51-6		660	U
orobenzene	95-50-1		330	U
phenol	95-48-7		330	U
oroisopropyl)ether	108-60-1		330	U
phenol	106-44-5		330	U
di-n-propylamine	621-64-7		330	U
roethane	67-72-1		330	U
zene	98-95-3		330	U
ne	78-59-1		330	U
enol	88-75-5		330	U
thylphenol	105-67-9		330	U
roethoxy)methane	111-91-1		330	U
Acid	65-85-0		1,650	U
rophenol	120-83-2		330	U
hlorobenzene	120-82-1		330	U
ene	91-20-3		330	U
niline	106-47-8		660	U
robutadiene	87-68-3		330	U
3-methylphenol	59-50-7		660	U
aphthalene	91-57-6		330	U
rocyclopentadiene	77-47-4		330	U
hlorophenol	88-06-2		330	U
hlorophenol	95-95-4		330	U
aphthalene	91-58-7		330	U
line	88-74-4		1,650	U
Phthalate	131-11-3		330	U
hylene	208-96-8		330	U
line	99-09-2		1,650	U
hene	83-32-9		330	U
phenol	51-28-5		1,650	U
enol	100-02-7		1,650	U

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Scientists and Engineers, Inc.

026-010; TH-28 1-3' bgs

Lab Sample ID: S-99-6-35-6

Client Sample ID:

zofuran	132-64-9		330	U
nitrotoluene	606-20-2		330	U
nitrotoluene	121-14-2		330	U
lphthalate	84-66-2		330	U
rophenyl phenyl ether	7005-72-3		330	U
ne	86-73-7		330	U
aniline	100-01-6		660	U
nitro-2-methylphenol	534-52-1		1,650	U
sodiphenylamine	86-30-6		330	U
nophenyl-phenylether	101-55-3		330	U
nlorobenzene	118-74-1		330	U
chlorophenol	87-86-5		1,650	U
nthrene	85-01-8	340	330	
cene	120-12-7		330	U
ole	86-74-8		660	U
tylphthalate	84-74-2		330	U
nthene	206-44-0	560	330	
	129-00-0	920	330	
enzylphthalate	85-68-7		330	U
a)anthracene	56-55-2		330	U
ne	218-01-9	370	330	
chlorobenzidine	91-94-1		1,650	U
thylhexyl)phthalate	117-81-7		330	U
tylphthalate	117-84-0		330	UJ
b)fluoranthene	205-99-2	430	330	J
k)fluoranthene	207-8-9		330	UJ
a)pyrene	50-32-8		330	UJ
1,2,3-cd)pyrene	193-39-5		660	UJ
a,h)anthracene	53-70-3		660	UJ
g,h,i)perylene	191-24-2		660	UJ

ate Compound	%Rec	Limits (%)
Fluorophenol	58 %	25 --- 121
enol-d5	48 %	24 --- 113
robenzene-d5	70 %	23 --- 120
Fluorobiphenyl	87 %	30 --- 115
4,6-Tribromophenol	83 %	19 --- 122
rphenyl-d14	129 %	18 --- 137

Qualifiers: "U" Indicates compound was searched for and not detected.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
"*" Indicates surrogates low due to matrix effect.

Note: Method detection limits are approximately 1/5 of reporting limits.

Walsh

ntal Scientists and Engineers, Inc.

C:\HPCHEM\1\DATA\070699\BNAB1270.D

ORIGINAL

3026-010; TH-28 1-3' bgs

Client Sample ID

Sample Tag No: 59677
Lab Sample ID: S-99-6-35-6
Matrix: Soil
Data Filename: BNAB1270.D

Date Analyzed: 07/06/99
Analyst: SBS
Dilution Factor: 1
Method: 8270
Units: µg/Kg

tatively Identified Compound	Concentration	Qualifier
nown Organic Compound	140	TJB
nown Organic Compound	190	TJB
nown Organic Compound	1800	TJB
yclohexen-1-one	170	TJ
nown Substituted Alkane	410	TJ
nown Organic Compound	220	TJ
nown Organic Compound	480	TJ
nown Substituted Alkene	170	TJ
ecular Sulfur	1900	TJ
nown Organic Compound	770	TJ

Qualifier:

"T" Indicates compound was tentatively identified by its mass spectrum.
All tentatively identified compounds are estimated values.

nalyst

Walsh

nmental Scientists and Engineers, Inc.

3026-010 I-70 - Brighton Blvd (CDOT)

SAMPLERS: (Signature)

Sta No	Date	Time	S / L		Station Location	Sample Tag No.	8260 VOCs	TEPH	8270 SVOCs		Wash H						No. of Containers	Remarks
TH-26	6/16/99	1330	X		1 - 3' bgs	59672	X	~~X~~	~~X~~	VM	1						#1	TPH, ~~Methog~~ VA
TH-26	6/17/99	1010	X		25 - 27' bgs	58376	X				2						1	
TH-26	6/17/99	1010	X		25 - 27' bgs	58025		X									1	
TH-26	6/16/99	1317	X		0 - 1' bgs	59673	~~OK~~	~~X~~	X		3						1	TEH & 8270
TH-28	6/17/99	1204	X		10 - 12' bgs	58027	X				4							
TH-28		1236	X		25 - 27' bgs	58026	X				5							
TH-28		1204	X		10 - 12' bgs	58383		X			4							
TH-28		1236	X		25 - 27' bgs	58028		X			5							
TH-28	↓	1150	X		1 - 3' bgs	59677			X		6							

Relinquished by: (Sign.)	Date/Time	Received by: (Sign.)	Relinquished by: (Sign.)	Date/Time	Received by: (Sign.)
	6/17/99 1624				
Relinquished by: (Sign.)	Date/Time	Received by: (Sign.)	Relinquished by: (Sign.)	Date/Time	Received by: (Sign.)
Relinquished by: (Sign.)	Date/Time	Received for Laboratory by: (Sign.)	Date/Time	Remarks:	
			6/17/99 1624		

Distribution: Original accompanies shipment; WATER

3026-010; TH-28 10-12' bgs

Client Sample ID

ORIGINAL

Sample Tag No: 58027
Lab Sample ID: S-99-6-35-4
Matrix: Soil
Date Sampled: 6/17/99
Data Filename: VOAA3405.D

EPA Method: 8260
Date Analyzed: 06/22/99
Analyst: SBS
Units: µg/Kg
Dilution Factor: 1

Analyte	CAS Number	Concentration	Quantitation Limits	Qualifier
Dichlorodifluoromethane	75-71-8		10	UJ
Chloromethane	74-87-3		10	UJ
Vinyl Chloride	75-01-4		5	UJ
Bromomethane	74-97-5		10	UJ
Chloroethane	75-00-3		10	UJ
Trichlorofluoromethane	75-69-4		10	UJ
1,1-Dichloroethene	75-35-4		5	UJ
Methylene Chloride	75-09-2		5	UJ
trans-1,2-Dichloroethene	156-60-5		5	UJ
1,1-Dichloroethane	75-34-3		5	UJ
cis-1,2-Dichloroethene	156-59-2		5	UJ
2,2-Dichloropropane	594-20-7		5	UJ
Bromochloromethane	74-97-5		5	UJ
Chloroform	67-66-3		5	UJ
1,1,1-Trichloroethane	71-55-6		5	UJ
1,1-Dichloropropene	563-58-6		5	UJ
Carbon Tetrachloride	56-23-5		5	UJ
1,2-Dichloroethane	107-06-2		5	UJ
Benzene	71-43-2		5	UJ
Trichloroethene	79-01-6		5	UJ
1,2-Dichloropropane	78-87-5		5	UJ
Dibromomethane	74-95-3		5	UJ
Bromodichloromethane	75-27-4		5	UJ
cis-1,3-Dichloropropene	10061-02-6		5	UJ
Toluene	108-88-3		5	UJ
trans-1,3-Dichloropropene	10061-01-5		5	UJ
1,1,2-Trichloroethane	79-00-5		5	UJ
1,2-Dibromoethane	106-93-4		5	UJ
1,3-Dichloropropane	142-28-9		5	UJ
Tetrachloroethene	127-18-4		5	UJ
Dibromochloromethane	124-48-1		5	UJ
Chlorobenzene	108-90-7		5	UJ
1,1,1,2-Tetrachloroethane	630-20-6		5	UJ
Ethylbenzene	100-41-4		5	UJ
m & p-Xylenes			5	UJ
o-Xylene	106-42-3		5	UJ

026-010; TH-28 25-27' bgs

Client Sample ID

ORIGINAL

Sample Tag No: 58026
Lab Sample ID: S-99-6-35-5
Matrix: Soil
Date Sampled: 6/17/99
Data Filename: VOAA3426.D

EPA Method: 8260
Date Analyzed: 06/22/99
Analyst: SBS
Units: µg/Kg
Dilution Factor: 1

te	CAS Number	Concentration	Quantitation Limits	Qualifier
rodifluoromethane	75-71-8		10	U
methane	74-87-3		10	U
Chloride	75-01-4		5	U
methane	74-97-5		10	U
ethane	75-00-3		10	U
rofluoromethane	75-69-4		10	U
chloroethene	75-35-4		5	U
ene Chloride	75-09-2		5	U
,2-Dichloroethene	156-60-5		5	U
chloroethane	75-34-3		5	U
-Dichloroethene	156-59-2		5	U
chloropropane	594-20-7		5	U
chloromethane	74-97-5		5	U
form	67-66-3		5	U
richloroethane	71-55-6		5	U
chloropropene	563-58-6		5	U
Tetrachloride	56-23-5		5	U
hloroethane	107-06-2		5	U
ne	71-43-2		5	U
oethene	79-01-6		5	U
hloropropane	78-87-5		5	U
omethane	74-95-3		5	U
ichloromethane	75-27-4		5	U
Dichloropropene	10061-02-6		5	U
e	108-88-3		5	U
3-Dichloropropene	10061-01-5		5	U
richloroethane	79-00-5		5	U
romoethane	106-93-4		5	U
loropropane	142-28-9		5	U
loroethene	127-18-4		5	U
chloromethane	124-48-1		5	U
enzene	108-90-7		5	U
Tetrachloroethane	630-20-6		5	U
nzene	100-41-4		5	U
ylenes			5	U
e	106-42-3		5	U

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ntal Scientists and Engineers, Inc.

)26-010; TH-28 25-27' bgs

Client Sample ID

Sample Tag No: 58026
Lab Sample ID: S-99-6-35-5
Matrix: Soil
Date Sampled: 06/17/99
Data Filename: VOAA3406.D

EPA Method: 8260
Date Analyzed: 06/22/99
Analyst: SBS
Units: µg/Kg
Dilution Factor: 1

ively Identified Compound	Concentration	Qualifier
ntatively Identified Compounds were detected.		

Qualifier:

"T" Indicates compound was tentatively identified by its mass spectrum.
All tentatively identified compounds are estimated values.

Analyst: [signature]

Walsh

tal Scientists and Engineers, Inc.

3026-010; TH-28 25-27' bgs

Lab Sample ID: S-99-6-35-5

Client Sample ID:

ene	100-42-5		5	U
noform	75-25-2		5	U
ropylbenzene	98-82-8		5	U
2,2-Tetrachloroethane	79-34-5		5	U
nobenzene	108-86-1		5	U
3-Trichloropropane	96-18-4		5	U
opylbenzene	103-65-1		5	U
lorotoluene	95-49-8		5	U
-Trimethylbenzene	108-67-8		5	U
ylbenzene	98-06-6		5	U
-Trimethylbenzene	95-63-6		5	U
ylbenzene	135-98-8		5	U
)ichlorobenzene	541-73-1		5	U
propyltoluene	99-87-6		5	U
ichlorobenzene	106-46-7		5	U
ylbenzene	104-51-8		5	U
ichlorobenzene	95-50-1		5	U
ibromo-3-chloropropane	96-12-8		5	U
Trichlorobenzene	120-82-1		5	U
chlorobutadiene	87-68-3		5	U
halene	91-20-3		5	U
Trichlorobenzene	87-61-6		5	U

gate Compound		%Rec	Limits (%)
)ibromofluoromethane		99 %	80 — 120
Toluene-d8		103 %	81 — 117
)-Bromofluorobenzene		103 %	74 — 121

Qualifiers: "U" Indicates compound was searched for and not detected.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
"*" Indicates surrogates low due to matrix effect.

Walsh

ental Scientists and Engineers, Inc.

Petroleum Hydrocarbons Report

3026-010; TH-28 10-12' bgs
Client Sample ID

ORIGINAL

thod: Mod. 8100
nple ID: 99-6-35-4
Soil
nber: 58383
mpled: 6/17/99

Analyst: SBS
Date Extracted: 6/29/99
Extractables Date Analyzed: 7/1/99
Units: mg/Kg

Extractables Dilution Factor: 1

	CAS Number	Concentration	Detection Limits	Qualifier
tractable Hydrocarbons	NA	6.0	3	

Surrogate Compound	%Recovery
(SS) o-Terphenyl	102 %

Qualifiers:

"U" Indicates compound was searched for and not detected at or above the method detection limit.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
" * " Indicates surrogate is outside of recovery limits due to matrix effect.

Analyst: _____

Walsh
Scientists and Engineers, Inc.

Petroleum Hydrocarbons Report

3026-010; TH-28 25-27' bgs

Client Sample ID

ORIGINAL

lethod: Mod. 8100
ample ID: 99-6-35-5
: Soil
umber: 58028
Sampled: 6/17/99

Analyst: SBS
Date Extracted: 6/29/99
Extractables Date Analyzed: 6/30/99
Units: mg/Kg

Extractables Dilution Factor: 1

e	CAS Number	Concentration	Detection Limits	Qualifier
xtractable Hydrocarbons	NA		3	U

Surrogate Compound	%Recovery
(SS) o-Terphenyl	80 %

Qualifiers:

"U" Indicates compound was searched for and not detected at or above the method detection limit.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
" * " Indicates surrogate is outside of recovery limits due to matrix effect.

Analyst: _____

Walsh
al Scientists and Engineers, Inc.

Volatile Organic Compounds Report

3026-010; TH-7

Client Sample ID

ORIGINAL

Sample Tag No.: 59012, 59013
Lab Sample ID: W-99-3-30-4
Matrix: Water
Data Filename: VOAA3213.D

EPA Method: 8260
Date Sampled: 03/23/99
Date Analyzed: 03/24/99
Analyst: SBS
Units: µg/L
Dilution Factor: 1

Analyte	CAS Number	Concentration	Quantitation Limits	Qualifier
Dichlorodifluoromethane	75-71-8		10	U
Chloromethane	74-87-3		10	U
Vinyl Chloride	75-01-4		5	U
Bromomethane	74-97-5		10	U
Chloroethane	75-00-3		10	U
Trichlorofluoromethane	75-69-4		10	U
1,1-Dichloroethene	75-35-4		5	U
Methylene Chloride	75-09-2		5	U
trans-1,2-Dichloroethene	156-60-5		5	U
1,1-Dichloroethane	75-34-3		5	U
cis-1,2-Dichloroethene	156-59-2		5	U
2,2-Dichloropropane	594-20-7		5	U
Bromochloromethane	74-97-5		5	U
Chloroform	67-66-3		5	U
1,1,1-Trichloroethane	71-55-6		5	U
1,1-Dichloropropene	563-58-6		5	U
Carbon Tetrachloride	56-23-5		5	U
1,2-Dichloroethane	107-06-2		5	U
Benzene	71-43-2		5	U
Trichloroethene	79-01-6		5	U
1,2-Dichloropropane	78-87-5		5	U
Dibromomethane	74-95-3		5	U
Bromodichloromethane	75-27-4		5	U
trans-1,3-Dichloropropene	10061-02-6		5	U
Toluene	108-88-3		5	U
cis-1,3-Dichloropropene	10061-01-5		5	U
1,1,2-Trichloroethane	79-00-5		5	U
1,2-Dibromoethane	106-93-4		5	U
1,3-Dichloropropane	142-28-9		5	U
Tetrachloroethene	127-18-4	61	25	
Dibromochloromethane	124-48-1		5	U
Chlorobenzene	108-90-7		5	U
1,1,1,2-Tetrachloroethane	630-20-6		5	U
Ethylbenzene	100-41-4		5	U
m & p-Xylenes			5	U

Walsh
Environmental Scientists and Engineers, Inc.

Volatile Organic Compounds Report

3026-010; TH-7

Lab Sample ID: W-99-3-30-4

Client Sample ID

o-Xylene	106-42-3		5	U
Styrene	100-42-5		5	U
Bromoform	75-25-2		5	U
Isopropylbenzene	98-82-8		5	U
1,1,2,2-Tetrachloroethane	79-34-5		5	U
Bromobenzene	108-86-1		5	U
1,2,3-Trichloropropane	96-18-4		5	U
n-Propylbenzene	103-65-1		5	U
2-Chlorotoluene	95-49-8		5	U
1,3,5-Trimethylbenzene	108-67-8		5	U
4-Chlorotoluene	106-43-4		5	U
t-Butylbenzene	98-06-6		5	U
1,2,4-Trimethylbenzene	95-63-6		5	U
s-Butylbenzene	135-98-8		5	U
1,3-Dichlorobenzene	541-73-1		5	U
p-Isopropyltoluene	99-87-6		5	U
1,4-Dichlorobenzene	106-46-7		5	U
n-Butylbenzene	104-51-8		5	U
1,2-Dichlorobenzene	95-50-1		5	U
1,2-Dibromo-3-chloropropane	96-12-8		5	U
1,2,4-Trichlorobenzene	120-82-1		5	U
Hexachlorobutadiene	87-68-3		5	U
Naphthalene	91-20-3		10	U
1,2,3-Trichlorobenzene	87-61-6		5	U

Surrogate Compound	%Rec	Recovery Limits (%)
(SS) Dibromofluoromethane	98 %	86 --- 118
(SS) Toluene-d8	101 %	88 --- 110
(SS) p-Bromofluorobenzene	100 %	86 --- 116

Qualifiers:

"U" Indicates compound was searched for and not detected.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
"D" Indicates compound was run at a dilution.
"*" Indicates surrogate recovery is not within method limits due to matrix effect.

Note: Method detection limits are approximately 1/5 of reporting limits.

Walsh
Environmental Scientists and Engineers, Inc.

Volatile Organic Compounds Report

3026-010; TH-7

Client Sample ID

Sample Tag No.: 59012, 59013
Lab Sample ID: W-99-3-30-4
Matrix: Water
Data Filename: VOAA3213.D

EPA Method: 8260
Date Analyzed: 03/24/99
Analyst: SBS
Units: µg/L

tively Identified Compound	Concentration	Qualifier
No Tentatively Identified Compounds were detected.		

Qualifier:

"T" Indicates compound was tentatively identified by its mass spectrum.
All tentatively identified compounds are estimated values.

Analyst: Stephanie B. Adam

Walsh
Scientists and Engineers, Inc.

Petroleum Hydrocarbons Report

3026-010; TH-7

ORIGINAL

A Method:	mod. 8015/mod. 8100	Analyst:	DPD
) Sample ID:	99-3-30-4	Volatiles Date Analyzed:	03/24/99
trix:	Water	Date Extracted:	03/24/99
) Number:	59009, 10, 11	Extractables Date Analyzed:	03/25/99
e Sampled:	03/23/99	Units:	µg/L

Volatiles Dilution Factor: 1

Extractables Dilution Factor: 1

lyte	CAS Number	Concentration	Reporting Limits	Qualifier
al Volatile Hydrocarbons	NA		500	U
al Extractable Hydrocarbons	NA	1300	1000	

Surrogate Compound	%Recovery
(SS) a,a,a-Trifluorotoluene	75 %
(SS) Fluorobenzene	115 %
(SS) o-Terphenyl	56 %

Qualifiers:

"U" Indicates compound was searched for and not detected at or above the method detection limit.
"B" Indicates compound was found in the method blank and has been corrected.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
" * " Indicates surrogate is outside of recovery limits due to matrix effect.

Analyst: Dongping Du

Walsh

onmental Scientists and Engineers, Inc.

Volatile Organic Compounds Report

3026-010; TH-19

Client Sample ID

ORIGINAL

Sample Tag No.: 59007, 59008
Lab Sample ID: W-99-3-30-3
Matrix: Water
Data Filename: VOAA3212.D

EPA Method: 8260
Date Sampled: 03/23/99
Date Analyzed: 03/24/99
Analyst: SBS
Units: µg/L
Dilution Factor: 1

Analyte	CAS Number	Concentration	Quantitation Limits	Qualifier
chlorodifluoromethane	75-71-8		10	U
loromethane	74-87-3		10	U
nyl Chloride	75-01-4		5	U
omomethane	74-97-5		10	U
loroethane	75-00-3		10	U
chlorofluoromethane	75-69-4		10	U
1-Dichloroethene	75-35-4		5	U
thylene Chloride	75-09-2		5	U
ns-1,2-Dichloroethene	156-60-5		5	U
l-Dichloroethane	75-34-3		5	U
-1,2-Dichloroethene	156-59-2		5	U
2-Dichloropropane	594-20-7		5	U
omochloromethane	74-97-5		5	U
loroform	67-66-3		5	U
,1-Trichloroethane	71-55-6		5	U
-Dichloropropene	563-58-6		5	U
rbon Tetrachloride	56-23-5		5	U
2-Dichloroethane	107-06-2		5	U
nzene	71-43-2		5	U
chloroethene	79-01-6		5	U
-Dichloropropane	78-87-5		5	U
romomethane	74-95-3		5	U
modichloromethane	75-27-4		5	U
ns-1,3-Dichloropropene	10061-02-6		5	U
uene	108-88-3		5	U
1,3-Dichloropropene	10061-01-5		5	U
,2-Trichloroethane	79-00-5		5	U
-Dibromoethane	106-93-4		5	U
-Dichloropropane	142-28-9		5	U
rachloroethene	127-18-4	160	25	
romochloromethane	124-48-1		5	U
robenzene	108-90-7		5	U
,1,2-Tetrachloroethane	630-20-6		5	U
ylbenzene	100-41-4		5	U
p-Xylenes			5	U

Walsh

nmental Scientists and Engineers, Inc.

Volatile Organic Compounds Report

3026-010; TH-19

Client Sample ID

Lab Sample ID: W-99-3-30-3

o-Xylene	106-42-3	5	U
Styrene	100-42-5	5	U
Bromoform	75-25-2	5	U
Isopropylbenzene	98-82-8	5	U
1,1,2,2-Tetrachloroethane	79-34-5	5	U
Bromobenzene	108-86-1	5	U
1,2,3-Trichloropropane	96-18-4	5	U
n-Propylbenzene	103-65-1	5	U
2-Chlorotoluene	95-49-8	5	U
1,3,5-Trimethylbenzene	108-67-8	5	U
4-Chlorotoluene	106-43-4	5	U
t-Butylbenzene	98-06-6	5	U
1,2,4-Trimethylbenzene	95-63-6	5	U
s-Butylbenzene	135-98-8	5	U
1,3-Dichlorobenzene	541-73-1	5	U
p-Isopropyltoluene	99-87-6	5	U
1,4-Dichlorobenzene	106-46-7	5	U
n-Butylbenzene	104-51-8	5	U
1,2-Dichlorobenzene	95-50-1	5	U
1,2-Dibromo-3-chloropropane	96-12-8	5	U
1,2,4-Trichlorobenzene	120-82-1	5	U
Hexachlorobutadiene	87-68-3	5	U
Naphthalene	91-20-3	10	U
1,2,3-Trichlorobenzene	87-61-6	5	U

Surrogate Compound	%Rec	Recovery Limits (%)
(SS) Dibromofluoromethane	100 %	86 --- 118
(SS) Toluene-d8	101 %	88 --- 110
(SS) p-Bromofluorobenzene	101 %	86 --- 116

Qualifiers:

"U" Indicates compound was searched for and not detected.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
"D" Indicates compound was run at a dilution.
"*" Indicates surrogate recovery is not within method limits due to matrix effect.

Note: Method detection limits are approximately 1/5 of reporting limits.

Walsh
Environmental Scientists and Engineers, Inc.

Volatile Organic Compounds Report

3026-010; TH-19

Client Sample ID

Sample Tag No.: 59007, 59008
Lab Sample ID: W-99-3-30-3
Matrix: Water
Data Filename: VOAA3212.D

EPA Method: 8260
Date Analyzed: 03/24/99
Analyst: SBS
Units: µg/L

Tentatively Identified Compound	Concentration	Qualifier
No Tentatively Identified Compounds were detected.		

Qualifier:

"T" Indicates compound was tentatively identified by its mass spectrum.
All tentatively identified compounds are estimated values.

Analyst: _____

Walsh
Environmental Scientists and Engineers, Inc.

Petroleum Hydrocarbons Report

3026-010; TH-19

ORIGINAL

EPA Method: mod. 8015/mod. 8100
Lab Sample ID: 99-3-30-3
Matrix: Water
Tag Number: 59004, 05, 06
Date Sampled: 03/23/99

Analyst: DPD
Volatiles Date Analyzed: 03/24/99
Date Extracted: 03/24/99
Extractables Date Analyzed: 03/25/99
Units: µg/L

Volatiles Dilution Factor: 1

Extractables Dilution Factor: 1

Analyte	CAS Number	Concentration	Reporting Limits	Qualifier
Total Volatile Hydrocarbons	NA		500	U
Total Extractable Hydrocarbons	NA		1000	U

Surrogate Compound	%Recovery
(SS) a,a,a-Trifluorotoluene	71 %
(SS) Fluorobenzene	111 %
(SS) o-Terphenyl	64 %

Qualifiers:

"U" Indicates compound was searched for and not detected at or above the method detection limit.
"B" Indicates compound was found in the method blank and has been corrected.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
" * " Indicates surrogate is outside of recovery limits due to matrix effect.

Analyst: Dongping Du

Walsh
Environmental Scientists and Engineers, Inc.

Volatile Organic Compounds Report

3026-010; TH-24

Client Sample ID

ORIGINAL

Sample Tag No.: 58997, 58998
Lab Sample ID: W-99-3-30-1
Matrix: Water
Data Filename: VOAA3214.D
VOAA3245.D

EPA Method: 8260
Date Sampled: 03/23/99
Date Analyzed: 3/24,26/99
Analyst: SBS
Units: µg/L
Dilution Factor: 5, 2

Analyte	CAS Number	Concentration	Quantitation Limits	Qualifier
Dichlorodifluoromethane	75-71-8		20	U
Chloromethane	74-87-3		20	U
Vinyl Chloride	75-01-4		10	U
Bromomethane	74-97-5		20	U
Chloroethane	75-00-3		20	U
Trichlorofluoromethane	75-69-4		20	U
1,1-Dichloroethene	75-35-4		10	U
Methylene Chloride	75-09-2		10	U
trans-1,2-Dichloroethene	156-60-5		10	U
1,1-Dichloroethane	75-34-3		10	U
cis-1,2-Dichloroethene	156-59-2		10	U
2,2-Dichloropropane	594-20-7		10	U
Bromochloromethane	74-97-5		10	U
Chloroform	67-66-3		10	U
1,1,1-Trichloroethane	71-55-6		10	U
1,1-Dichloropropene	563-58-6		10	U
Carbon Tetrachloride	56-23-5		10	U
1,2-Dichloroethane	107-06-2		10	U
Benzene	71-43-2		10	U
Trichloroethene	79-01-6		10	U
1,2-Dichloropropane	78-87-5		10	U
Dibromomethane	74-95-3		10	U
Bromodichloromethane	75-27-4		10	U
trans-1,3-Dichloropropene	10061-02-6		10	U
Toluene	108-88-3		10	U
cis-1,3-Dichloropropene	10061-01-5		10	U
1,1,2-Trichloroethane	79-00-5		10	U
1,2-Dibromoethane	106-93-4		10	U
1,3-Dichloropropane	142-28-9		10	U
Tetrachloroethene	127-18-4	480	25	D
Dibromochloromethane	124-48-1		10	U
Chlorobenzene	108-90-7		10	U
1,1,1,2-Tetrachloroethane	630-20-6		10	U
Ethylbenzene	100-41-4		10	U
m & p-Xylenes			10	U

Walsh
Environmental Scientists and Engineers, Inc.

Volatile Organic Compounds Report

3026-010; TH-24

Lab Sample ID: W-99-3-30-1

Client Sample ID

o-Xylene	106-42-3	10	U
Styrene	100-42-5	10	U
Bromoform	75-25-2	10	U
Isopropylbenzene	98-82-8	10	U
1,1,2,2-Tetrachloroethane	79-34-5	10	U
Bromobenzene	108-86-1	10	U
1,2,3-Trichloropropane	96-18-4	10	U
n-Propylbenzene	103-65-1	10	U
2-Chlorotoluene	95-49-8	10	U
1,3,5-Trimethylbenzene	108-67-8	10	U
4-Chlorotoluene	106-43-4	10	U
t-Butylbenzene	98-06-6	10	U
1,2,4-Trimethylbenzene	95-63-6	10	U
s-Butylbenzene	135-98-8	10	U
1,3-Dichlorobenzene	541-73-1	10	U
p-Isopropyltoluene	99-87-6	10	U
1,4-Dichlorobenzene	106-46-7	10	U
n-Butylbenzene	104-51-8	10	U
1,2-Dichlorobenzene	95-50-1	10	U
1,2-Dibromo-3-chloropropane	96-12-8	10	U
1,2,4-Trichlorobenzene	120-82-1	10	U
Hexachlorobutadiene	87-68-3	10	U
Naphthalene	91-20-3	20	U
1,2,3-Trichlorobenzene	87-61-6	10	U

Surrogate Compound	%Rec	Recovery Limits (%)
(SS) Dibromofluoromethane	101 %	86 --- 118
(SS) Toluene-d8	101 %	88 --- 110
(SS) p-Bromofluorobenzene	104 %	86 --- 116

Qualifiers:

"U" Indicates compound was searched for and not detected.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
"D" Indicates compound was run at a dilution.
"*" Indicates surrogate recovery is not within method limits due to matrix effect.

Note: Method detection limits are approximately 1/5 of reporting limits.

Walsh
Environmental Scientists and Engineers, Inc.

Volatile Organic Compounds Report

3026-010; TH-24

Client Sample ID

Sample Tag No.: 58997, 58998
Lab Sample ID: W-99-3-30-1
Matrix: Water
Data Filename: VOAA3214.D
VOAA3245.D

EPA Method: 8260
Date Analyzed: 3/24,26/99
Analyst: SBS
Units: µg/L

Tentatively Identified Compound	Concentration	Qualifier
No Tentatively Identified Compounds were detected.		

Qualifier:

"T" Indicates compound was tentatively identified by its mass spectrum.
All tentatively identified compounds are estimated values.

Analyst: _____

Walsh
Environmental Scientists and Engineers, Inc.

Petroleum Hydrocarbons Report

ORIGINAL

3026-010; TH-24

PA Method: mod. 8015/mod. 8100
ab Sample ID: 99-3-30-1
atrix: Water
ag Number: 58994, 95, 96
ate Sampled: 03/23/99

Analyst: DPD
Volatiles Date Analyzed: 03/24/99
Date Extracted: 03/24/99
Extractables Date Analyzed: 03/25/99
Units: µg/L

Volatiles Dilution Factor: 1

Extractables Dilution Factor: 1

alyte	CAS Number	Concentration	Reporting Limits	Qualifier
tal Volatile Hydrocarbons	NA	600	500	
tal Extractable Hydrocarbons	NA		1000	U

Surrogate Compound	%Recovery
(SS) a,a,a-Trifluorotoluene	77 %
(SS) Fluorobenzene	125 %
(SS) o-Terphenyl	39 % *

Qualifiers:

"U" Indicates compound was searched for and not detected at or above the method detection limit.
"B" Indicates compound was found in the method blank and has been corrected.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
" * " Indicates surrogate is outside of recovery limits due to matrix effect.

Analyst: Dongming Du

Walsh
onmental Scientists and Engineers, Inc.

Volatile Organic Compounds Report

3026-010; TH-25

Client Sample ID

ORIGINAL

Sample Tag No.: 59002, 59003
Lab Sample ID: W-99-3-30-2
Matrix: Water
Data Filename: VOAA3238.D

EPA Method: 8260
Date Sampled: 03/23/99
Date Analyzed: 03/26/99
Analyst: SBS
Units: µg/L
Dilution Factor: 1

:e	CAS Number	Concentration	Quantitation Limits	Qualifier
rodifluoromethane	75-71-8		10	U
methane	74-87-3		10	U
Chloride	75-01-4		5	U
methane	74-97-5		10	U
ethane	75-00-3		10	U
rofluoromethane	75-69-4		10	U
chloroethene	75-35-4		5	U
ene Chloride	75-09-2		5	U
,2-Dichloroethene	156-60-5		5	U
chloroethane	75-34-3		5	U
-Dichloroethene	156-59-2		5	U
chloropropane	594-20-7		5	U
chloromethane	74-97-5		5	U
orm	67-66-3		5	U
richloroethane	71-55-6	6.9	5	
hloropropene	563-58-6		5	U
Tetrachloride	56-23-5		5	U
hloroethane	107-06-2		5	U
e	71-43-2		5	U
oethene	79-01-6		5	U
loropropane	78-87-5		5	U
omethane	74-95-3		5	U
ichloromethane	75-27-4		5	U
3-Dichloropropene	10061-02-6		5	U
	108-88-3		5	U
Dichloropropene	10061-01-5		5	U
ichloroethane	79-00-5		5	U
omoethane	106-93-4		5	U
loropropane	142-28-9		5	U
oroethene	127-18-4	23	5	
chloromethane	124-48-1		5	U
nzene	108-90-7		5	U
Tetrachloroethane	630-20-6		5	U
zene	100-41-4		5	U
ylenes			5	U

Walsh
Scientists and Engineers, Inc.

Volatile Organic Compounds Report

3026-010; TH-25

Lab Sample ID: W-99-3-30-2

Client Sample ID

lene	106-42-3	5	U
ene	100-42-5	5	U
oform	75-25-2	5	U
opylbenzene	98-82-8	5	U
2,2-Tetrachloroethane	79-34-5	5	U
obenzene	108-86-1	5	U
3-Trichloropropane	96-18-4	5	U
pylbenzene	103-65-1	5	U
lorotoluene	95-49-8	5	U
-Trimethylbenzene	108-67-8	5	U
orotoluene	106-43-4	5	U
ylbenzene	98-06-6	5	U
-Trimethylbenzene	95-63-6	5	U
ylbenzene	135-98-8	5	U
ichlorobenzene	541-73-1	5	U
opropyltoluene	99-87-6	5	U
ichlorobenzene	106-46-7	5	U
ylbenzene	104-51-8	5	U
ichlorobenzene	95-50-1	5	U
ibromo-3-chloropropane	96-12-8	5	U
-Trichlorobenzene	120-82-1	5	U
chlorobutadiene	87-68-3	5	U
halene	91-20-3	10	U
-Trichlorobenzene	87-61-6	5	U

gate Compound	%Rec	Recovery Limits (%)
Dibromofluoromethane	100 %	86 --- 118
oluene-d8	103 %	88 --- 110
-Bromofluorobenzene	101 %	86 --- 116

Qualifiers:

"U" Indicates compound was searched for and not detected.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
"D" Indicates compound was run at a dilution.
"*" Indicates surrogate recovery is not within method limits due to matrix effect.

Note: Method detection limits are approximately 1/5 of reporting limits.

Volatile Organic Compounds Report

3026-010; TH-25

Client Sample ID

Sample Tag No.: 59002, 59003
Lab Sample ID: W-99-3-30-2
Matrix: Water
Data Filename: VOAA3238.D

EPA Method: 8260
Date Analyzed: 03/26/99
Analyst: SBS
Units: µg/L

atively Identified Compound	Concentration	Qualifier
No Tentatively Identified Compounds were detected.		

Qualifier:

"T" Indicates compound was tentatively identified by its mass spectrum.
All tentatively identified compounds are estimated values.

Analyst: _____

Walsh

nental Scientists and Engineers, Inc.

Petroleum Hydrocarbons Report

3026-010; TH-25

ORIGINAL

PA Method:	mod. 8015/mod. 8100	Analyst:	DPD
ab Sample ID:	99-3-30-2	Volatiles Date Analyzed:	03/24/99
latrix:	Water	Date Extracted:	03/24/99
ag Number:	58999, 59000, 59001	Extractables Date Analyzed:	03/24/99
ate Sampled:	03/23/99	Units:	µg/L

Volatiles Dilution Factor: 1

Extractables Dilution Factor: 1

nalyte	CAS Number	Concentration	Reporting Limits	Qualifier
otal Volatile Hydrocarbons	NA		500	U
otal Extractable Hydrocarbons	NA		1000	U

Surrogate Compound	%Recovery
(SS) a,a,a-Trifluorotoluene	57 %
(SS) Fluorobenzene	102 %
(SS) o-Terphenyl	52 %

Qualifiers:

"U" Indicates compound was searched for and not detected at or above the method detection limit.
"B" Indicates compound was found in the method blank and has been corrected.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
" * " Indicates surrogate is outside of recovery limits due to matrix effect.

Analyst: Dongping Dai

Walsh

onmental Scientists and Engineers, Inc.

Walsh
Environmental Scientists and Engineers, Inc.

CHAIN OF CUSTODY RECORD

No. 8763

4888 Pearl East Circle, Suite 108
Boulder Colorado 80301

PM: STAN SPENCER 99-3-30

Proj. No. 3026-010 Project Name I-70 / Brighton Blvd

SAMPLERS: (Signature)

Sta No	Date	Time	H_2O	Station Location	Sample Tag No.	8260 VOCs	TVPH	TEPH	Walsh #	No. of Containers	Remarks
TH-24	3/23/97		X		58994,95,96,97,98	X	X	X	1	5	Ice, HCl
TH-25	3/23/97		X		58999, 59000, 01, 02, 03	X	X	X	2	5	Ice, HCl
TH-19			X		59004, 05, 06 07, 08	X	X	X	3	5	
TH-20			X	VOID	59009, 59010, 11, 12, 13	X	X	X		5	
TH-18			X	VOID	59014, 15, 16 17, 18	X	X	X		5	
TH-22			X	VOID	59019, 20, 21, 22, 23	X	X	X		5	
TH-21	↓		X	VOID	59024, 25, 26, 27, 28	X	X	X		5	↓
TH-7	3/13/97	1217	X		59009/10, 11, 12 13	X	X	V	4	5	

Relinquished by: (Sign.)	Date/Time	Received by: (Sign.)	Relinquished by: (Sign.)	Date/Time	Received by: (Sign.)
	3/23/97 1345				
Relinquished by: (Sign.)	Date/Time	Received by: (Sign.)			

3026-010; TH-26

Client Sample ID

Sample Tag No: 58390, 91, 92
Lab Sample ID: W-99-6-42-1
Matrix: Water
Date Sampled: 6/23/99
Data Filename: VOAA3432.D
VOAA3450.D

EPA Method: 8260
Date Analyzed: 6/23,24/9
Analyst: SBS
Units: µg/L
Dilution Factor: 1
2

/te	CAS Number	Concentration	Quantitation Limits	Qualifier
ɔrodifluoromethane	75-71-8		20	DU
ɔmethane	74-87-3		10	U
Chloride	75-01-4		5	U
ɔmethane	74-97-5		10	U
ɔethane	75-00-3		10	U
ɔrofluoromethane	75-69-4		10	U
chloroethene	75-35-4		5	U
lene Chloride	75-09-2		5	U
1,2-Dichloroethene	156-60-5		5	U
chloroethane	75-34-3		5	U
?-Dichloroethene	156-59-2		5	U
chloropropane	594-20-7		5	U
ɔchloromethane	74-97-5		5	U
ɔform	67-66-3		5	U
Trichloroethane	71-55-6		5	U
chloropropene	563-58-6		5	U
n Tetrachloride	56-23-5		5	U
chloroethane	107-06-2		5	U
ne	71-43-2		5	U
ɔroethene	79-01-6		5	U
chloropropane	78-87-5		5	U
ɲomethane	74-95-3		5	U
dichloromethane	75-27-4		5	U
-Dichloropropene	10061-02-6		5	U
ıe	108-88-3		5	U
,3-Dichloropropene	10061-01-5		5	U
Trichloroethane	79-00-5		5	U
ɔromoethane	106-93-4		5	U
chloropropane	142-28-9		5	U
ɲloroethene	127-18-4	300	10	D
ɲochloromethane	124-48-1		5	U
benzene	108-90-7		5	U
-Tetrachloroethane	630-20-6		5	U
ɜnzene	100-41-4		5	U
Xylenes			5	U
ɲe	106-42-3		5	U

Walsh

ental Scientists and Engineers, Inc.

3026-010; TH-26

Lab Sample ID: W-99-6-42-1

Client Sample ID:

ene	100-42-5		5	U
noform	75-25-2		5	U
ropylbenzene	98-82-8		5	U
2,2-Tetrachloroethane	79-34-5		5	U
nobenzene	108-86-1		5	U
3-Trichloropropane	96-18-4		5	U
opylbenzene	103-65-1		5	U
ılorotoluene	95-49-8		5	U
5-Trimethylbenzene	108-67-8		5	U
tylbenzene	98-06-6		5	U
4-Trimethylbenzene	95-63-6		5	U
tylbenzene	135-98-8		5	U
Dichlorobenzene	541-73-1		5	U
ıpropyltoluene	99-87-6		5	U
Dichlorobenzene	106-46-7		5	U
tylbenzene	104-51-8		5	U
Dichlorobenzene	95-50-1		5	U
Dibromo-3-chloropropane	96-12-8		5	U
-Trichlorobenzene	120-82-1		5	U
ıchlorobutadiene	87-68-3		5	U
ıthalene	91-20-3		5	U
-Trichlorobenzene	87-61-6		5	U

ogate Compound		%Rec	Limits (%)
Dibromofluoromethane		85 %	70 --- 130
Toluene-d8		84 %	70 --- 130
p-Bromofluorobenzene		83 %	70 --- 130

Qualifiers: "U" Indicates compound was searched for and not detected.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
"*" Indicates surrogates low due to matrix effect.
"D" Indicates result obtained from a dilution.

Walsh

ımental Scientists and Engineers, Inc.

3026-010; TH-26

Client Sample ID

Sample Tag No: 58390, 91, 92
Lab Sample ID: W-99-6-42-1
Matrix: Water
Date Sampled: 06/23/99
Data Filename: VOAA3432.D
VOAA3450.D

EPA Method: 8260
Date Analyzed: 6/23,24/9
Analyst: SBS
Units: µg/L
Dilution Factor: 1
2

ıtively Identified Compound	Concentration	Qualifier
ɛntatively Identified Compounds were detected.		

Qualifier:

"T" Indicates compound was tentatively identified by its mass spectrum.
All tentatively identified compounds are estimated values.

Analyst: _____

Walsh

ıental Scientists and Engineers, Inc.

Petroleum Hydrocarbons Report

ORIGINAL

3026-010; Brighton TH-26
Client Sample ID

ethod: Mod. 8100
mple ID: 99-6-42-1
Water
mber: 58390/91/92
ampled: 6/23/99

Analyst: SBS
Date Extracted: 6/23/99
Extractables Date Analyzed: 7/2/99
Units: mg/L

xtractables Dilution Factor: 1

	CAS Number	Concentration	Detection Limits	Qualifier
xtractable Hydrocarbons	NA		1	U

Surrogate Compound	%Recovery
(SS) o-Terphenyl	51 %

Qualifiers:

"U" Indicates compound was searched for and not detected at or above the method detection limit.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
" * " Indicates surrogate is outside of recovery limits due to matrix effect.

Analyst: _____

Walsh
al Scientists and Engineers, Inc.

3026-010; TH-27

Client Sample ID

Sample Tag No: 58393. 94, 95
Lab Sample ID: W-99-6-42-2
Matrix: Water
Date Sampled: 6/23/99
Data Filename: VOAA3433.D
VOAA3449.D

EPA Method: 8260
Date Analyzed: 6/23,24/9
Analyst: SBS
Units: µg/L
Dilution Factor: 1
2

yte	CAS Number	Concentration	Quantitation Limits	Qualifier
orodifluoromethane	75-71-8		20	DU
omethane	74-87-3		10	U
Chloride	75-01-4		5	U
omethane	74-97-5		10	U
oethane	75-00-3		10	U
orofluoromethane	75-69-4		10	U
ichloroethene	75-35-4		5	U
lene Chloride	75-09-2		5	U
1,2-Dichloroethene	156-60-5		5	U
chloroethane	75-34-3		5	U
2-Dichloroethene	156-59-2		5	U
chloropropane	594-20-7		5	U
chloromethane	74-97-5		5	U
form	67-66-3		5	U
Trichloroethane	71-55-6		5	U
chloropropene	563-58-6		5	U
n Tetrachloride	56-23-5		5	U
chloroethane	107-06-2		5	U
ne	71-43-2		5	U
roethene	79-01-6		5	U
chloropropane	78-87-5		5	U
nomethane	74-95-3		5	U
dichloromethane	75-27-4		5	U
-Dichloropropene	10061-02-6		5	U
e	108-88-3		5	U
,3-Dichloropropene	10061-01-5		5	U
richloroethane	79-00-5		5	U
romoethane	106-93-4		5	U
chloropropane	142-28-9		5	U
loroethene	127-18-4	**340**	10	D
ochloromethane	124-48-1		5	U
benzene	108-90-7		5	U
-Tetrachloroethane	630-20-6		5	U
enzene	100-41-4		5	U
Xylenes			5	U
e	106-42-3		5	U

Walsh

ental Scientists and Engineers, Inc.

3026-010; TH-27

Client Sample ID

Sample Tag No: 58393, 94, 95
Lab Sample ID: W-99-6-42-2
Matrix: Water
Date Sampled: 06/23/99
Data Filename: VOAA3433.D
VOAA3449.D

EPA Method: 8260
Date Analyzed: 6/23,24/9
Analyst: SBS
Units: µg/L
Dilution Factor: 1
2

atively Identified Compound	Concentration	Qualifier
entatively Identified Compounds were detected.		

Qualifier:

"T" Indicates compound was tentatively identified by its mass spectrum.
All tentatively identified compounds are estimated values.

Analyst: _____

Walsh

ental Scientists and Engineers, Inc.

3026-010; TH-27

Lab Sample ID: W-99-6-42-2

Client Sample ID:

ene	100-42-5		5	U
noform	75-25-2		5	U
ropylbenzene	98-82-8		5	U
2,2-Tetrachloroethane	79-34-5		5	U
nobenzene	108-86-1		5	U
3-Trichloropropane	96-18-4		5	U
opylbenzene	103-65-1		5	U
lorotoluene	95-49-8		5	U
5-Trimethylbenzene	108-67-8		5	U
ylbenzene	98-06-6		5	U
-Trimethylbenzene	95-63-6		5	U
tylbenzene	135-98-8		5	U
Dichlorobenzene	541-73-1		5	U
propyltoluene	99-87-6		5	U
Dichlorobenzene	106-46-7		5	U
ylbenzene	104-51-8		5	U
ichlorobenzene	95-50-1		5	U
ibromo-3-chloropropane	96-12-8		5	U
-Trichlorobenzene	120-82-1		5	U
chlorobutadiene	87-68-3		5	U
thalene	91-20-3		5	U
-Trichlorobenzene	87-61-6		5	U

gate Compound		%Rec	Limits (%)
Dibromofluoromethane		83 %	70 --- 130
Toluene-d8		83 %	70 --- 130
p-Bromofluorobenzene		85 %	70 --- 130

Qualifiers: "U" Indicates compound was searched for and not detected.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
"*" Indicates surrogates low due to matrix effect.
"D" Indicates result obtained from a dilution.

Walsh

ental Scientists and Engineers, Inc.

Petroleum Hydrocarbons Report

3026-010; Brighton TH-27
Client Sample ID

ORIGINAL

Method: Mod. 8100
Sample ID: 99-6-42-2
ix: Water
Number: 58393/94/95
Sampled: 6/23/99

Analyst: SBS
Date Extracted: 6/23/99
Extractables Date Analyzed: 6/24/99
Units: mg/L

Extractables Dilution Factor: 1.25

yte	CAS Number	Concentration	Detection Limits	Qualifier
Extractable Hydrocarbons	NA		1.25	U

Surrogate Compound	%Recovery
(SS) o-Terphenyl	91 %

Qualifiers:

"U" Indicates compound was searched for and not detected at or above the method detection limit.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
" * " Indicates surrogate is outside of recovery limits due to matrix effect.

Analyst: _____

Walsh
ental Scientists and Engineers, Inc.

3026-010; TH-28

Client Sample ID

Sample Tag No: 58396, 97, 98
Lab Sample ID: W-99-6-42-3
Matrix: Water
Date Sampled: 6/23/99
Data Filename: VOAA3448.D

EPA Method: 8260
Date Analyzed: 06/24/99
Analyst: SBS
Units: µg/L
Dilution Factor: 1

te	CAS Number	Concentration	Quantitation Limits	Qualifier
rodifluoromethane	75-71-8		10	U
omethane	74-87-3		10	U
Chloride	75-01-4		5	U
omethane	74-97-5		10	U
ethane	75-00-3		10	U
rofluorbmethane	75-69-4		10	U
chloroethene	75-35-4		5	U
ene Chloride	75-09-2		5	U
,2-Dichloroethene	156-60-5		5	U
chloroethane	75-34-3		5	U
-Dichloroethene	156-59-2		5	U
chloropropane	594-20-7		5	U
chloromethane	74-97-5		5	U
form	67-66-3		5	U
richloroethane	71-55-6		5	U
chloropropene	563-58-6		5	U
Tetrachloride	56-23-5		5	U
chloroethane	107-06-2		5	U
ne	71-43-2		5	U
roethene	79-01-6		5	U
chloropropane	78-87-5		5	U
omethane	74-95-3		5	U
dichloromethane	75-27-4		5	U
-Dichloropropene	10061-02-6		5	U
e	108-88-3		5	U
,3-Dichloropropene	10061-01-5		5	U
richloroethane	79-00-5		5	U
romoethane	106-93-4		5	U
loropropane	142-28-9		5	U
loroethene	127-18-4	160	5	
ochloromethane	124-48-1		5	U
enzene	108-90-7		5	U
Tetrachloroethane	630-20-6		5	U
nzene	100-41-4		5	U
Xylenes			5	U
e	106-42-3		5	U

Walsh

ntal Scientists and Engineers, Inc.

3026-010; TH-28

Client Sample ID

Sample Tag No: 58396, 97, 98
Lab Sample ID: W-99-6-42-3
Matrix: Water
Date Sampled: 06/23/99
Data Filename: VOAA3448.D

EPA Method: 8260
Date Analyzed: 06/24/99
Analyst: SBS
Units: µg/L
Dilution Factor: 1

tatively Identified Compound	Concentration	Qualifier
Tentatively Identified Compounds were detected.		

Qualifier:

"T" Indicates compound was tentatively identified by its mass spectrum.
All tentatively identified compounds are estimated values.

Analyst: [signature]

Walsh

ıental Scientists and Engineers, Inc.

3026-010; TH-28

Lab Sample ID: W-99-6-42-3

Client Sample ID:

Styrene	100-42-5		5	U
Bromoform	75-25-2		5	U
Isopropylbenzene	98-82-8		5	U
1,1,2,2-Tetrachloroethane	79-34-5		5	U
Bromobenzene	108-86-1		5	U
1,2,3-Trichloropropane	96-18-4		5	U
n-Propylbenzene	103-65-1		5	U
2-Chlorotoluene	95-49-8		5	U
1,3,5-Trimethylbenzene	108-67-8		5	U
t-Butylbenzene	98-06-6		5	U
1,2,4-Trimethylbenzene	95-63-6		5	U
s-Butylbenzene	135-98-8		5	U
1,3-Dichlorobenzene	541-73-1		5	U
p-Isopropyltoluene	99-87-6		5	U
1,4-Dichlorobenzene	106-46-7		5	U
n-Butylbenzene	104-51-8		5	U
1,2-Dichlorobenzene	95-50-1		5	U
1,2-Dibromo-3-chloropropane	96-12-8		5	U
1,2,4-Trichlorobenzene	120-82-1		5	U
Hexachlorobutadiene	87-68-3		5	U
Naphthalene	91-20-3		5	U
1,2,3-Trichlorobenzene	87-61-6		5	U

Surrogate Compound		%Rec	Limits (%)
(SS) Dibromofluoromethane		74 %	70 — 130
(SS) Toluene-d8		77 %	70 — 130
(SS) p-Bromofluorobenzene		74 %	70 — 130

Qualifiers: "U" Indicates compound was searched for and not detected.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
"*" Indicates surrogates low due to matrix effect.

Walsh
Environmental Scientists and Engineers, Inc.

Petroleum Hydrocarbons Report

3026-010; Brighton TH-28
Client Sample ID

ORIGINAL

\ Method: Mod. 8100
Sample ID: 99-6-42-3
ix: Water
Number: 58396/97/98
Sampled: 6/23/99

Analyst: SBS
Date Extracted: 6/23/99
Extractables Date Analyzed: 6/24/99
Units: mg/L

Extractables Dilution Factor: 1

te	CAS Number	Concentration	Detection Limits	Qualifier
Extractable Hydrocarbons	NA		1	U

Surrogate Compound	%Recovery
(SS) o-Terphenyl	51 %

Qualifiers:

"U" Indicates compound was searched for and not detected at or above the method detection limit.
"B" Indicates compound was found in the method blank.
"J" Indicates compound was identified out of the method working limits and should be considered an estimated value.
" * " Indicates surrogate is outside of recovery limits due to matrix effect.

Analyst: _____

Valsh
ientists and Engineers, Inc.

480546

Superfund DOCUMENT CODING SHEET

SITE NAME (Required): VASQUEZ BOULEVARD AND I-70
CERCLIS NUMBER: C00002259588 **SSID:** *(Add the two digit Site Spill ID #)* 08 - 9R

OPERABLE UNIT *(Add the applicable operable unit(s))*: 01 and 02

PHASE ACTIVITY (Required): *(Check one or more boxes)*

- ☐ Brownfields
- ☐ Emergency Response/ Time Critical Removals
- ☐ HRS
- ☐ Natural Resource Damages
- ☐ Non-Time Critical Removal
- ☐ Post Construction
- ☐ Post Work Cost Recovery Action
- ☐ Remedial Design/ Remedial Action
- ☒ Remedial Studies/ Remedy Selection
- ☐ Removal Site Evaluation
- ☐ Site Assessment

DOCUMENT TYPE (Required): *(Check one or more boxes)*

- ☐ Access Related
- ☐ CERCLIS Documentation
- ☐ Comfort Letters
- ☐ Community Relations
- ☐ Construction Related
- ☒ Correspondence External
- ☐ Correspondence Internal
- ☑ Correspondence PRP
- ☐ Data & Related Documents
- ☐ Decision Documents
- ☐ Design Related
- ☐ Enforcement
- ☐ Financial & Contract Documents
- ☐ HRS Package
- ☐ IAGs, MOAs, SSCs & CAs
- ☐ Map (Photo, Video, Tape, etc)
- ☒ Notice Letter & 104(e) Related
- ☐ Orders, Settlements
- ☐ Plans (Workplans, QAPPs, CRP, HASP)
- ☐ Reports
- ☐ Risk Assessment - Ecological
- ☐ Risk Assessment - Human Health

REFERENCE: *(List PRPs Document Pertains to Below)*

- ☑ DENVER
- ☐
- ☐
- ☐
- ☐
- ☐

ACCESS CODE (Required): *(Check Applicable Boxes)*

- ☐ Attorney Work Product
- ☐ Attorney-Client Comm.
- ☐ CBI Claimed
- ☐ CBI Determined
- ☐ Deliberative Process
- ☐ OGC OK
- ☐ Enforcement Confidential
- ☐ Privacy
- ☑ **Releasable** (Public)

RELATED DOCUMENTS (ATTACHMENTS):

Total Number of Attachment(s): _____

Title of Attachment(s):	Number of Attachment(s):
	OF
	OF
	OF
	OF

COLLECTIONS: *(Write the title of your collection on the line provided. Then check the box to add the document to the selected collection.)*

Administrative Record Collections	Special Collections	FOIA Collections	Discovery Collections	Cost Recovery Collections
☑ 104(e) response	☐ Work Performed	☐	☐	☐
☐ from Denver	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐

NOTES TO RECORDS CENTER: Please list attachments separately.

SIGNATURE BOX (Required)

Program Lead: Mari Herman DATE: 4/27/00

Attorney: Matt Cohn DATE: 11/15/00

Revised March 1, 2000, *previous versions are obsolete.*